NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 4, NUMBER 14 APRIL 6, 1987

SPECIAL SECTION: DEC

Closed is open, says Ken Olsen

Network World *interviews DEC's canny president.*

If you had asked our astute opinions before this interview, Network World *Features Editor Steve Moore and I would have said we viewed Ken Olsen as the white knight of open computer networks and Digital Equipment Corp. as his trusty steed.*

After all, we would have reasoned, DEC was one of the earliest participants in General Motors Corp.'s effort to make the Manufacturing Automation Protocol a standard for factory networks. And DEC has based DECnet, the backbone of its networking strategy, on Ethernet, a local-area networking technology whose specifications have long been in the public domain. In addition, DEC has railed

☞ See **Olsen** page 31

▶ A NEW GENERATION

IBM PCs promise network advances

BY PAULA MUSICH
Senior Editor

NEW YORK — Under the umbrella of its Systems Applications Architecture, IBM last week unveiled a new generation of personal computers and a multitasking operating system that promises by 1989 to support advanced networking capabilities, such as true peer-to-peer communications. IBM also announced enhancements to existing network offerings.

The Personal System/2 family of microcomputers includes models based on Intel's low-end 8086 chip, 80286 microprocessor and high-performance 80386 chip set. Models based on the 80386 chip provide three times the processing power of the Personal Computer AT.

Analysts applauded PS/2 and said net advantages are worth the wait, page 4.

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▶ PRIVATE BRANCH EXCHANGES

AT&T, Northern Tel to address low end

BY BOB WALLACE
Senior Editor

AT&T and Northern Telecom, Inc. will reveal new models of their staple mid-range private branch exchanges this week in an effort to extend the advanced networking features of these switches to users in the under-250-line marketplace, *Network World* has learned.

AT&T is expected to introduce today the System 75 XE, a modular, lower cost version of the existing System 75, specifically positioned to be more affordable in smaller line sizes. The System 75 XE will support 40 to 600 lines as opposed to current models of the System 75,

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▶ NETWORK MANAGEMENT

Early NetView users pleased

BY PAUL KORZENIOWSKI
Senior Editor

Early users of NetView praise the IBM network management system's ease of use and are anxiously awaiting enhancements to the product, including links to NetView/PC, but point out the system taxes mainframe resources.

Sears Communications Network, Inc., First Interstate Services Co. and Southwestern Bell Corp. have installed the first release of NetView, announced in May, and are already using it to manage their corporate networks. Other large IBM users, including Fidelity Investments Co., Michelin Tire Co., American Express Co. and Bank of Boston Corp., told *Network World* they plan to install

See **NetView** page 47

Early users rate IBM's NetView

Users: First Interstate Services Co.,
Sears Communications Network, Inc.,
Southwestern Bell Corp.

Likes:
- A strategic product that serves as a foundation for future net management products from IBM and other vendors.
- Easier to use than the stand-alone packages it replaced.
- Cuts down on training needed for network administrators.
- Offers new functions not found in IBM's stand-alone net management tools.
- Easy to install.

Dislikes:
- Eats up mainframe processing power.
- Net performance data consumes large amounts of virtual storage and can degrade host performance.
- Needs to support other key IBM net management products.

NETWORK LINE

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The U.S. modem market garners a slew of new entries, both domestic and international, at the Interface '87 conference. Page 2.

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NEWSPAPER

▶ INTERFACE '87

Trade restraint issue tops show

Foreign telecom forays on rise.

BY MARY PETROSKY
West Coast Correspondent

LAS VEGAS, Nev. — The increasingly global nature of the networking industry was clear at last week's Interface '87 conference, where a number of giant multinational vendors announced their entry into the U.S. market and speakers decried foreign restraints on free trade.

Philips Industries N.V., a $60 billion company, and $12 billion British Telecommunications plc announced their entry into the U.S. data communications market with the introduction of high-speed modems, and Japanese giant Fujitsu Ltd. showed a new modem line that it will sell to

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▶ HIGH-SPEED MODEM MARKET

Philips, British Telecom join U.S. modem market

BY MARY PETROSKY
West Coast Correspondent

LAS VEGAS, Nev. — International Goliaths British Telecom Datacomms and Philips Information Systems, Inc. staked their claims to the U.S. data communications market last week as both firms announced at Interface '87 that they will market high-speed modems in this country.

The firms were among a slew of companies to introduce modems and modem-related subsystems at the communications conference. Fujitsu America, Inc.'s Data Communications Group showcased five modems ranging from 2,400 bit/sec to 14.4K bit/sec. Largo, Fla.-based Paradyne Corp. introduced two diagnostic modems in the 14.4K and 19.2K bit/sec range, as well as a network management system.

In addition, both Rockwell International Corp. and Emulex Corp. announced 14.4K bit/sec board-level modem subsystems. While these products are aimed at modem makers, not end users, the availability of these components will lead to development of a larger number of high-speed modems, resulting in lower prices, spokesmen for both companies said.

Paradyne is offering its 14.4K bit/sec 3450 diagnostic modem, which may be upgraded to 19.2K bit/sec, for $8,900. The 3470, a 19.2K bit/sec modem, is priced at $11,500. The two modems are much smaller than their MPX series predecessors, using a single board instead of the previous seven boards. The modems feature a two-channel buffered time-division multiplexer, network management diagnostics and support of trellis-coded modulation.

Paradyne's automated network management and control system, Analysis 6510, offers network di-

See **Philips** page 47

▶ MINI ON A STRING

Users split on swapping PCs for minis

BY PAULA MUSICH
Senior Editor

LAS VEGAS, Nev. — Users at last week's Interface '87 conference here split on whether personal computer networks can replace larger processors, such as minicomputers, for important applications.

William Spies was among the users interviewed by *Network World* who believe personal computers can supplant more established host systems. Spies is senior telecommunications officer for the First National Bank of Maryland in Baltimore. "We decided on a personal computer network instead of a minicomputer for our work-order process application," Spies said. The application supports the firm's service organization, which repairs data equipment.

"It allows us to electronically transfer a work ticket from one department to another so they can do what's necessary for the technician to complete a job," Spies said. "We originally bought a minicomputer to handle the application, but it never functioned as well as PCs, which we linked with a 3Com [Corp.] Ethernet.

"The application required us to use spreadsheets, a data base management system and word processing," Spies said. "The PCs had them available, while they weren't available on the mini. We were running [Arts Computer Products, Inc.'s] Word Perfect, which was easy to share; Lotus [Development Corp.'s 1-2-3], which worked fine; and [Ashton-Tate's] dBase III."

Hugh Anderson, a senior member of the technical staff for Systems and Applied Sciences Corp. of Dayton, Ohio, agreed that certain applications, such as word processing, are better suited to personal

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SAA is the first, slow step on the IBM road to true connectivity, say users. **Page 19.**

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Network World wants to make its news coverage better, and for that we ask your help. If you know of an interesting event that just occurred or is about to occur, please call. We'd also like to know how you optimize your networks. Call Bruce Hoard toll-free at (800) 343-6474.

▶ INTERFACE '87

Telenet offers IDN T-1 service

Extends network to 130 new cities.

BY JIM BROWN
New Products Editor

LAS VEGAS, Nev. — In an attempt to expand beyond packet switching, Telenet Communications Corp. announced last week it will tap the fiber-optic network resources of its parent US Sprint Communications Co. to offer Integrated Digital Network (IDN), which is a T-1-based service supporting voice and data.

The company also announced plans to expand its public packet-switching network by 40% over the next 12 months, the largest expansion plan in the company's history.

According to John B. Holmblad, vice-president of network systems, Telenet will add roughly 130 city locations to its network by deploying packet switches and packet assemblers/disassemblers. Telenet currently serves more than 600 cities and towns from 340 locations.

IDN, introduced at the Interface '87 conference here, melds the company's traditional packet-switching services and equipment with US Sprint's T-1 transmission facilities accessed using T-1 multiplexers provided by Timeplex, Inc. under a private label agreement.

Together, these components will enable Telenet to build private T-1 backbone networks that support voice and provide the transport capacity to support packet-switched subnetworks. Hybrid networks can

See **Telenet** page 44

▶ PROJECT VICTORIA

FCC rule won't halt trial

BY BOB WALLACE
Senior Editor

WASHINGTON, D.C. — Pacific Bell said its commercial trial of Project Victoria will proceed as scheduled, despite a Federal Communications Commission ruling last week that bars the company from bundling needed interface equipment with the service.

The FCC ruled last week the black boxes used in Project Victoria to link users' equipment to Pacific Bell's network are customer premises equipment. Under FCC rules, customer premises equipment cannot be bundled with services provided by the Bell operating companies.

The FCC's ruling that the black

See **FCC** page 6

Correction: A *Network World* article ("Where credit is due," March 16, 1987) contained an incorrect reference to CompuServe, Inc. The Columbus, Ohio-based CompuServe is owned by H & R Block, Inc.

Also, the chart accompanying the article "Mixed messages" (*NW*, March 23, 1987) incorrectly implied that the charges for CompuServe's two electronic mail services, EasyPlex and InfoPlex, are identical. In fact, the charges listed in the chart apply only to the EasyPlex service. CompuServe declined to provide prices for its InfoPlex service.

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▶ PACKET SWITCHING

Siemens to enter U.S. private packet net mart

BY PAM POWERS
Senior Editor

LAS VEGAS, Nev. — Siemens Data Switching Systems, Inc. said at last week's Interface '87 conference it will begin marketing its line of packet-switching network products directly to large U.S. companies.

Siemens officials are predicting the company will garner over the next three years between 10% and 15% of what the company believes is a rapidly growing market for private packet network equipment. Analysts questioned the company's market growth predictions and said Siemens will face tough competition from established U.S. vendors.

The company has sold packet gear in the U.S., but primarily to the Bell operating companies.

In a speech delivered at the conference, Albert E. Cohen, Siemens' president, said that after years of addressing the private packet market "selectively," the company has decided to "aggressively pursue the substantial business opportunities that market presents." Siemens has sold its Advanced Network Processor nodes and Network Control Centers to the BOCs since 1984. Those products will now be marketed to large users building private packet nets.

Cohen indicated the shift to private networking will require Siemens to "reorient the product line to meet new customer needs." Along those lines, Siemens will develop a low-cost network management system, increase its protocol conversion support and expand its existing line of networking products, such as modems and multiplexers, he said.

Siemens also announced last week the formation of the Corporate Network Sales Group, a direct sales force dedicated to private network sales. Tom Papa, formerly vice-president of sales for Telenet Communications Corp., will head up that group.

Papa said Siemens "concentrated its efforts on the BOCs and never actively pursued" the private market. The company has, however, built private networks for non-BOC clients, including Western Union Corp. and the Commonwealth of Pennsylvania.

Papa said he thinks Siemens is well-equipped to compete against the likes of Telenet, M/A-Com, Inc. and BBN Communications Corp., all of which have a strong presence in the private packet arena. Siemens' multinational presence, which is critical to the successful implementation of worldwide networks, gives it a strong advantage over other vendors, Papa said.

Fritz Ringling, a vice-president with Stamford, Conn.-based Gartner Group, Inc., indicated that Siemens may run into the same problem it had when it targeted the BOC market for packet gear. "The anticipation Siemens had for growth in BOC business just didn't materialize," he said. "Siemens had success penetrating the BOCs, but the market never developed as the company predicted."

Ringling said the private market has suffered from an inflated projection of 30% annual growth that has not been realized. "The private packet market is growing relatively slowly," he said.

But recent developments may change that. IBM has moved to support better the X.25 packet protocol, and analysts believe that move will bolster packet network sales. The cost of multidrop data networks is "reaching the threshhold of pain" and could spur creation of private packet nets, Ringling said.

▶ INDUSTRY REACTION

Promise of IBM PC worth the wait?

BY PAUL KORZENIOWSKI
Senior Editor

IBM's new generation personal computer and its multitasking operating system will boost the connectivity capabilities of microcomputers in such important areas as peer-to-peer networking and distributed processing. But it will be a long time before users can take advantage of the advanced networking features of the Personal System/2, analysts told *Network World* last week.

Current models of the IBM Personal Computer are not well-equipped to support peer-to-peer applications, observers agreed. Once loaded with advanced and memory-consuming communications software, such as IBM's LU 6.2, little room is left for applications. Also, the existing Personal Computer operating system, PC-DOS, is single-tasking and cannot support the multiple sessions needed for a true peer-to-peer connection between processors.

Most Personal System/2 models utilize a new operating system, Operating System/2 (OS/2), which is multitasking and supports a greater amount of main memory, up to 16M bytes of random-access memory, 25 times that of the previous limitation of 640K bytes.

"With a multitasking operating system, an application can go to a data base, select some records, format them and insert them into a spreadsheet without a user ever knowing that the processes are taking place," said Frank Dzubeck, president of Communication Network Architectures, Inc., a Washington, D.C. consulting firm.

The multitasking operating system also enhances Personal Computer support of distributed applications, such as distributed data base management. "Because the Personal Computer was single-tasking, it could only receive data under IBM Distributed Data Management," Dzubeck said. "That constraint limited its usefulness in a distributed data base environment."

A version of Distributed Data Management for the Personal System/2 would enable it to act as both a send and receive node.

The new microcomputer's multitasking capabilities also enhance other applications, such as electronic mail. "Previously, the only way to notify someone that you sent him a message was to pick up the telephone and call him," said Rudolf Strobl, senior consultant at Arthur D. Little, Inc. in Cambridge, Mass. "Now, a message may flash on the microcomputer's screen."

Analysts predicted that users and application developers will need a good deal of time to study the new products before they really understand how to take advantage of their enhanced networking capabilities. "Most users are still wrestling with how to design a spreadsheet," Strobl said. "It will take time before they begin to understand the Personal System/2's benefits."

While multitasking paves the way for true peer-to-peer networking by allowing microcomputer users to establish two-way sessions with a host, file transfer and data conversion software is still required to exchange useful information.

"The announcement does not address high-level protocol issues," said John Pickens, senior communications architect at Communications Solutions, Inc., a San Jose, Calif., software and consulting supplier. "Different systems still support various data formats, and standards have to be established for exchanging data between different systems."

A shortcoming with the new operating system is that some applications written for IBM's PC-DOS operating system may not run on the new machine. An IBM spokesman said that the applications most likely to experience problems are those that relied on the IBM Personal Computer's timing sequence. Unfortunately, many communications packages fall into that category, including micro-to-mainframe links and file transfer packages.

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▶ ACQUISITION

BBN buys mux maker

BY PAUL KORZENIOWSKI
Senior Editor

CAMBRIDGE, Mass. — Bolt, Beranek & Newman, Inc. (BBN) last week set its sights on the high end of the T-1 multiplexer market with the $18 million purchase of Network Switching Systems (NSS), a start-up T-1 multiplexer manufacturer in Andover, Mass.

To finance this and other corporate acquisitions, BBN issued $75 million of convertible subordinated debentures in a public offering filed with the Securities and Exchange Commission (SEC). BBN will also grant to the underwriters — PaineWebber, Inc., Merrill Lynch Capital Markets and Montgomery Securities — an option to acquire up to $11,250,000 more in debentures.

The debentures will be convertible at any time prior to maturity, unless previously redeemed into shares of BBN common stock. In keeping with SEC rules, BBN and NSS officials are restricted from discussing the financial fine points of the deal.

The NSS purchase gives BBN's subsidiary, BBN Communications Corp., entry into the private voice network market. Traditionally, the company has supplied U.S. government agencies and large corporate customers with packet-switching products used in wide-area data networks, such as the Department of Defense's Advanced Research Project Agency Network. With the purchase, BBN moves into a new market against established T-1 suppliers such as Timeplex, Inc., General DataComm Industries, Inc., Network Equipment Technologies, Inc. and Digital Communications Associates, Inc.

Analysts said NSS's roots in packet switching and the planned packet-switching capabilities of the N16 T-1 multiplexer make the company a natural partner for BBN and its family of packet as-

See **BBN** page 43

▶ OPEN NETWORK ARCHITECTURE

Users: RBHCs disregard essential ONA concerns

BY KARYL SCOTT
Washington, D.C. Correspondent

LOS ANGELES — For the second time in as many meetings, telecommunications users accused the regional Bell holding companies of failing to address key user issues at the Open Network Architecture (ONA) Forum here last week.

Large communications users associations, equipment vendors and information service providers gathered for the second ONA forum in hopes of hearing RBHC plans for making ONA features available to the marketplace. The first meeting was held last October.

The users said the RBHCs are using the forums to plan for their own future network needs, to the exclusion of users. Attendees said they would like RBHC engineers to discuss possible network features and applications with their user counterparts.

The forums are sponsored by Bell Communications Research, Inc., the research and development arm of the RBHCs.

ONA is a regulatory requirement created by the Federal Communications Commission mandating that AT&T and the BOCs provide enhanced service providers and end users with equal access to their networks and establish standard network interfaces. It is one of the central components of the FCC's Third Computer Inquiry ruling of last June.

As part of the ONA requirement, the BOCs must identify and standardize basic service elements offered through their networks and then provide those service elements at tariffed rates. Some proposed examples of basic service elements are call-forwarding, abbreviated dialing, call waiting and call number identification.

The FCC instructed AT&T and the BOCs to meet with communications users and providers to identify these basic network building blocks, which will be needed in order to bring new information services to the market.

"If you walked into the meeting without knowing who was in attendance, you would never know that users had any role in this at all," said Kenneth Phillips, chairman of the Committee of Corporate Telecommunications Users.

"The ONA Forum is an intellectually incestuous process," Phillips said. "You have the RBHCs in large measure addressing themselves and trying to confirm their faith in a process none of them understand."

James Blaszak, attorney for the Ad Hoc Telecommunications Users Committee, agreed. "The RBHCs were clearly addressing issues of concern to themselves first and foremost," he said.

"And secondly, they addressed issues relating to enhanced service providers. They were not looking at end-user issues at all," Blaszak added.

Southwestern Bell Corp. and US West, Inc. said their primary ONA market was information service

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▶ FOREIGN COMPETITION

U.S./Japan trade war broils

BY JOSH GONZE
Staff Writer

WASHINGTON, D.C. — A telecommunications trade dispute between the U.S. and Japan escalated to the highest offices of both nations when President Reagan fired off a letter to Japanese Prime Minister Yasuhiro Nakasone demanding that Japan allow greater foreign competition in its telecommunications market.

In a March 27 letter, Reagan said Japan must comply with the 1985 Market Oriented Sector Selective (MOSS) agreements reached between the two nations. The agreements would have allowed foreign companies to hold a 33% stake in ventures formed to compete against Kokusai Denshin Denwa (KDD), Japan's international services monopoly. On the same day, Reagan imposed stiff tariffs designed to limit imports of Japanese electronic goods. Reagan's letter was reportedly drafted by U.S. National Security Adviser Frank Carlucci.

Reagan intervened in the dispute after Japan's top communications official rejected earlier demands from U.S. and UK leaders concerned about trade imbalances with Japan. On March 26, Shunjiro Karasawa, minister of Japan's Ministry of Post and Telecommunications, reaffirmed in a letter to U.S. Department of Commerce Secretary Malcolm Baldrige Japan's demand that two private consortia formed to compete against KDD in international services be combined. Non-Japanese companies would be limited to a 3% stake in the combined venture, Karasawa said.

Pacific Telesis Group, a regional Bell holding company, holds an interest in one of the consortia, which is led by C. Itoh & Co. Ltd. The group also includes the UK's Cable & Wireless p.l.c. The consortium had planned to construct a Japan-to-Alaska fiber-optic cable.

Karasawa rejected the plan in his letter, saying there would not be enough transpacific business for two cables. KDD already has one cable installed.

Pacific Telesis has said that a 3% investment would not be sufficient for it to participate in construction of the cable.

Reagan's letter was prompted by a Senate resolution introduced by Sen. Frank Murkowski (R-Alaska) and passed on March 20 that called on Reagan to pressure the Japanese government to permit greater participation by foreign firms in the Japanese telecommunications market.

However, officials at the Office of the U.S. Trade Representative see little chance of a Japanese reversal and may simply bargain for a greater U.S. share in a merged consortium, according to a spokesman for the agency.

Users from **page 2**

computers in a local network than larger hosts. End users at the company had been using an IBM mainframe-based word processing system. "We found it was quicker to do it on a PC and print to a laser printer connected to our [Wang Laboratories, Inc.] Wangnet," Anderson said.

Rob Anderson, operations analyst at Dole Processed Foods Co. in San Jose, Calif., also said he believes that personal computer networks are taking on more important roles within companies. "The work load is going away from the larger processors down to the PCs," he said.

Despite that, Dole won't be replacing larger systems with local networks. The company is looking to download information from a mainframe into a local net server and allowing users to manipulate the information and produce their own reports. Rob Anderson said the company is leery of allowing users to upload information into the mainframe because of the potential for corrupting the integrity of the data base.

"Users will have to go through controls to upload information, and we'll probably have to limit the applications that can do this," he said.

Rob Anderson doesn't feel all applications are better served on personal computer networks, however. Personal computer spreadsheets such as 1-2-3 are too limited in size, he said. "If we're doing sales research, we can only do it for one region; we can't cover everyone with Lotus because of it's 640K-byte limitation," he said. "We can run a Priam [Corp.] spreadsheet on the mini and connect PCs on the LAN to the mini."

Other users reject the notion that local nets can be used in place of larger processors because they say networks do not provide adequate control over corporate data. Dennis Mrock, vice-president at Standard Federal Savings & Loan Assn. in Troy, Mich., said he feels the central control over information provided by the company's mainframe cannot be replicated in a network with existing software.

"We're mainly a mainframe shop," Mrock said. "We'll ship files down to PCs and allow users to manipulate that data, but we need to control that information. We'll install a network in a few years, but it won't replace anything."

For users such as Sidney Haggard of the U.S. Department of Agriculture's office of information resources management, managing an organization's information architecture can only be done on a larger processor.

"I see PCs being used by individuals to do their own thing," Haggard said. "In managing information, do you allow each person to have his own information? What information has to be integrated into the corporate data base? What has to be accessible by people at different levels in the organization?

"A structure to manage information has to be in place before you effectively integrate personal computer networks," he said.

Others see personal computer networks as an adjunct to larger processors. "There's been a tremendous influx of personal computers in my organization, but they're being used as desktop workstations for professionals running spreadsheet applications or graphics," said R. Keith Gwinn, telecommunications supervisor at Monsanto Co. in Miamisburg, Ohio.

"For office automation and larger types of systems, we use the PCs as terminal devices going back to the host over a local network."

FCC from **page 2**

box is customer premises equipment means that Pacific Bell will have to price Project Victoria equipment and service separately. A Pacific Bell spokeswoman said the ruling applies only to the commercial trial of Project Victoria.

Pacific Bell will have to adhere to complex new accounting rules designed by the FCC to separate financial information on regulated and nonregulated ventures. The rules replaced older strictures that required the BOCs to market equipment through separate subsidiaries. According to FCC rules regarding equipment linked to the public network, Pacific Bell will also have to make public the design information on the black box that could be used by competitors to develop gear.

In June, Pacific Bell asked the FCC to rule on whether the black boxes could be labeled multiplexers. Under the FCC's Third Computer Inquiry guidelines, a multiplexer is not considered customer premises equipment and could therefore be packaged and sold by a BOC as part of a communications service.

A number of data communications equipment vendors had asked the FCC to label the black box as customer premises equipment. IBM, Telenet Communications Corp., Tymnet/McDonnell Douglas Network Systems Co., Western Union Corp. and all five members of the Independent Data Communications Manufacturers Association (IDCMA) contested Pacific Bell's claim that equipment used to deliver the Integrated Services Digital Network-like integrated voice/data communications service was only a multiplexer.

Mike Eastwood, executive director of new network applications for Pacific Bell, said the FCC ruling would not change the BOC's plans for a first commercial test of the ISDN-like service scheduled to get under way this fall in Los Angeles.

"The FCC ruling has not affected our plans for the trial. It is our determination that everything will go on as scheduled," he said.

"What the ruling does affect is how we plan to go about booking, accounting for and administering the cost of deploying the service," Eastwood added.

Pacific Bell is seeking clarification of certain elements of the FCC ruling. Eastwood said the BOC would not take any action until the FCC responds to its request for information.

Herbert Marks, General Counsel for IDCMA, said he was pleased with the FCC's ruling.

"We have achieved our goal of keeping customer premises equipment from disappearing into Pacific Bell's network," Marks said.

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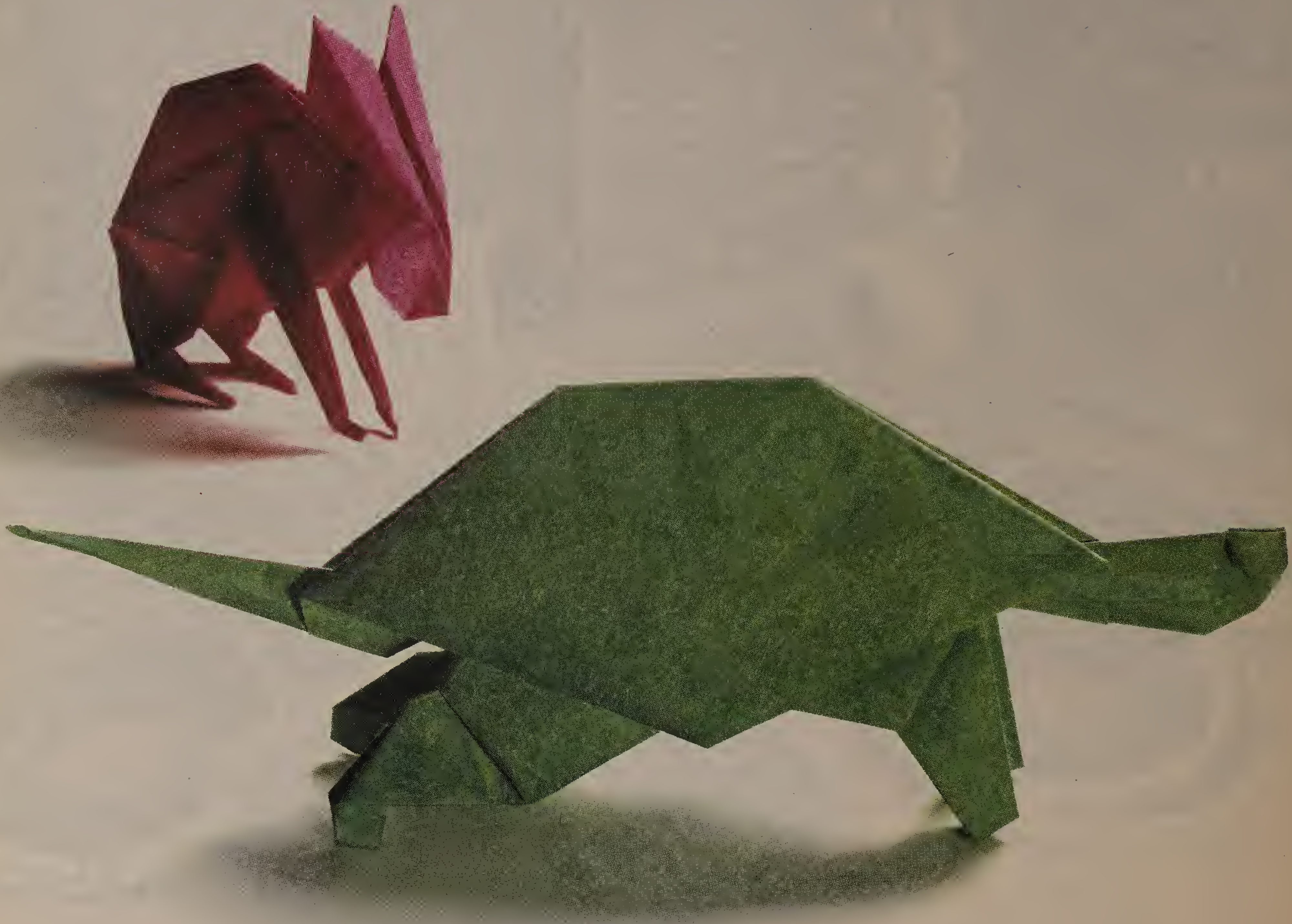

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INDUSTRY UPDATE

> “The key to [economic growth] in the next two years is the foreign sector. The continuing deterioration in the nation’s trade balance, which subtracted 1.2 points from the growth of real GNP last year, is expected to improve and to make a positive contribution to economic growth this year and next. If trade remains weak, however, growth will be sluggish at best, with 1987 in particular bordering on recession.
>
> From the Bell South Economic Review

▶ INTERNATIONAL MARKETING

U.S. firms find growth abroad

Overseas income expected to rise.

BY PAM POWERS
Senior Editor

In the face of flagging domestic sales, communications equipment vendors are relying more heavily on international markets to buoy their profits.

Companies that have suffered low or flat growth rates in the U.S. are seeing much stronger growth in international markets and, as a result, are devoting more resources to marketing their products abroad, vendors told *Network World*. And while political factors have created some barriers to entry for the U.S. vendor abroad, the falling dollar and the more favorable economic climate still make international marketing a lucrative endeavor.

“The growth potential overseas has far outstretched that in the U.S. for us,” said Russel Dopson, vice-president of international sales for data communications vendor Micom, Inc. of Simi Valley, Calif. Dopson said statistics indicate the U.S. market now totals 66% of the worldwide market for data communications, but that will change swiftly. “In three years, Europe will dominate the worldwide market by a few percentage points over the U.S.,” he predicted.

Consequently, Micom expects an increasingly larger portion of its annual revenue to come from sales of local nets, multiplexers, X.25 and other equipment to overseas markets, and is devoting a large part of its energies to that arena. “By 1988, 50% of our available market will be overseas,” Dopson

See **Abroad** page 10

Growth in international communications markets

Sales:

Local nets

1986	$242m
1990	$372m

Packet switches

1986	$163.8m
1990	$433.3m

Network management systems*

1986	$11.6m
1990	$34.1m

* based on sales of modem-based management systems

SOURCES: FROST & SULLIVAN, INC., NEW YORK
INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

INDUSTRY EYE

ROBERT J. BAUER

NetView PC in standards vanguard

NetView PC opens the door for network management vendors who wish to interface their systems with IBM systems. With this IBM Personal Computer-based software, users will be able to manage voice and data equipment effectively from a single point of control.

The level of network control available to the user will be determined by how quickly networking vendors support NetView with third-party enhancements. Already, several data and voice communications vendors intend to meet the criteria for NetView PC support.

By building compatible interfaces, vendors can exceed the network management capabilities now offered by IBM. For instance, more sophisticated network management systems will present the user with a multiwindow color graphics display that features two- and three-dimensional views of the network on both regional and global levels.

These network management systems, with built-in NetView PC interfaces, will allow users to start diagnostic troubleshooting at the terminal level and follow both local- and wide-area network environments all the way to the front-end processor and host to resolve problems.

Ultimately, standardized network management systems that enable users to collect and store all technical control, network control and performance monitoring information on an independent workstation will eliminate the need for host-based network management.

Systems will monitor multiple vendors’ equipment to support the user’s universal networking needs. By accepting NetView PC as a de facto network management standard, vendors can develop integrated network management strategies and ease the transition to a total systems solution.

Today, users of complex, geographically dispersed networks generally agree that centralized network management, regardless of equipment location or compatibility, is the best way to boost performance. However, lack of network management standards raises questions of how to implement integrated network management.

Without a standardized approach, users are forced to rely on a hodgepodge of solutions to detect and isolate problems, reroute voice and data traffic, and monitor performance for each disparate networking element. This fragmented approach costs the corporation more money to maintain daily operation, and it restricts flexibility.

Governing standards bodies such as the Corporation for Open Systems and the Consultative Committee on International Telephony and Telegraphy are just now addressing comprehensive network management standards. The laborious and time-consuming process of defining and developing these standards will delay true multivendor network management.

To further complicate matters, by the time these standards are accepted into the marketplace, network management technology will probably have

See **NetView** page 10

Bauer is vice-president of marketing for Infotron Systems Corp. in Cherry Hill, N.J.

▶ ACQUISITIONS

COMSAT unloads a cash loser

BY PAM POWERS
Senior Editor

WASHINGTON, D.C. — Communications Satellite Corp. recently sold its financially troubled telephony equipment business for an undisclosed sum to Coherent Communications Systems Corp.

The business, which was part of COMSAT’s TeleSystems, Inc. subsidiary, manufactures and markets analog, digital and acoustic echo cancellers and companders. Echo cancellers eliminate line echoes, and companders reduce noise on telephone lines.

Coherent, a division of Safeguard Scientifics, Inc., located in Hauppauge, N.Y., sells a range of modems and multiplexers, signaling equipment and other telephony products to large domestic carriers and the Postal Telephone and Telegraph administration operations in Europe. The company has annual sales of about $10 million.

A COMSAT spokeswoman said the division was not profitable, losing $5.6 million in 1986. She attributed its weak sales to a soft market for telephony products in the wake of the consolidation of long-distance carriers.

Because of flagging sales and recent efforts to divest itself of noncore businesses, she said COMSAT stopped soliciting customers and divested the division’s financial results from its own in the fourth quarter of 1986.

Jeremy Skene, Coherent’s vice-president of marketing, said the acquisition is a potentially profitable business. “The business floundered with COMSAT because the company didn’t concentrate on making it successful,” Skene said. “Telephony products fit extremely well into our product line.”

He added that Coherent’s large-carrier customer base will provide a ready channel for sale of the products. “We also intend to improve the manufacturing process to diminish the cost of the operation,” Skene said.

In addition to product rights, Coherent gains any product orders on file with COMSAT at the time of the agreement.

Skene said his company has kept many employees from the division. Coherent will immediately assume all aspects of the business, including service and support. ◪

NetView from **page 9**

surpassed the standard.

Vendors intent on designing innovative and compatible network management solutions that support current needs and accommodate future growth are at a crossroads.

On the one hand, vendors must develop expandable, flexible tools that allow users to take advantage of emerging integrated voice/data services.

On the other hand, they must design network management products that support accepted market standards in order to protect the user's investment and provide product migration paths.

IBM has made initial inroads with NetView PC, its interface for non-IBM vendors seeking connectivity with NetView environments.

Targeted at users with products in the Systems Network Architecture environment, NetView PC provides the framework for building a common set of network management protocols and standard interfaces.

As such, it will quickly become the first recognized de facto network management standard. ▣

Abroad from **page 9**

projected.

Infotron Corp., based in Cherry Hill, N.J., is also experiencing rapid growth internationally, according to the company's vice-president of international marketing, Bob Francis. Infotron's UK subsidiary doubled its sales to $14 million in 1986, and Francis said he conservatively estimates $21 million in sales this year. Infotron markets a high-end multiplexer overseas.

Francis maintained that the UK is by far the most sophisticated and accessible of the European markets. "Most European countries have stringent requirements and restrictions on equipment purchases, and the Postal Telephone and Telegraph organizations strongly favor local vendors," he said.

Digital Communications Associates, Inc. (DCA), based in Alpharetta, Ga., has watched its international sales soar 70% in the past year, according to Bob Reed, DCA's vice-president of international distribution. But he too said there are significant barriers to marketing overseas, not all of them attributable to the Europeans.

"It's difficult for a U.S. company to develop products for other countries," Reed said. "Europe isn't one country. Every country within it has different networking requirements." Despite the obstacles, DCA expects a 30% compound annual growth rate overseas, and Reed said the company is putting more money into expanding its non-U.S. presence. DCA will first set up a European support center for customers and distributors, and within a year, it will create an international division, which will operate as a separate profit and loss center.

The success U.S. vendors have encountered could turn out to be a mixed blessing. Paradyne, which has marketed modems and multiplexers overseas for some 15 years, now has to work harder for its market share, said Mike Oda, Paradyne's manager of international marketing. "The competition is hot and heavy, and it's getting worse," he said. "I've seen a lot of price erosion as the markets get crowded."

The recent plunge in the dollar against foreign currencies is both a boon and a bane. "The dollar's decline has made our products more expensive, but it has had the same effect for our U.S. competitors," Infotron's Francis said.

Nonetheless, vendors had bullish projections for their overseas businesses and said they plan to step up efforts accordingly. Reed said the overall climate is more hospitable. "Europeans aren't as fickle as Americans," he said. "They establish relationships based on trust, rather than price. Once you have their trust, they will stick with you to the end." ▣

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TELECOM TRENDS

Allnet completes fiber network

Allnet Communications Services, Inc., (ALCS) last week announced completion of a 417-mile fiber-optic network that serves 14 major southern Michigan cities to the carrier's current long-distance network.

ALCS said the lightwave system will be pressed into service to handle the communications needs of its roughly 450,000 business and residential users located in Michigan.

▶ NETWORK MANAGEMENT

US Sprint takes on Formica's network

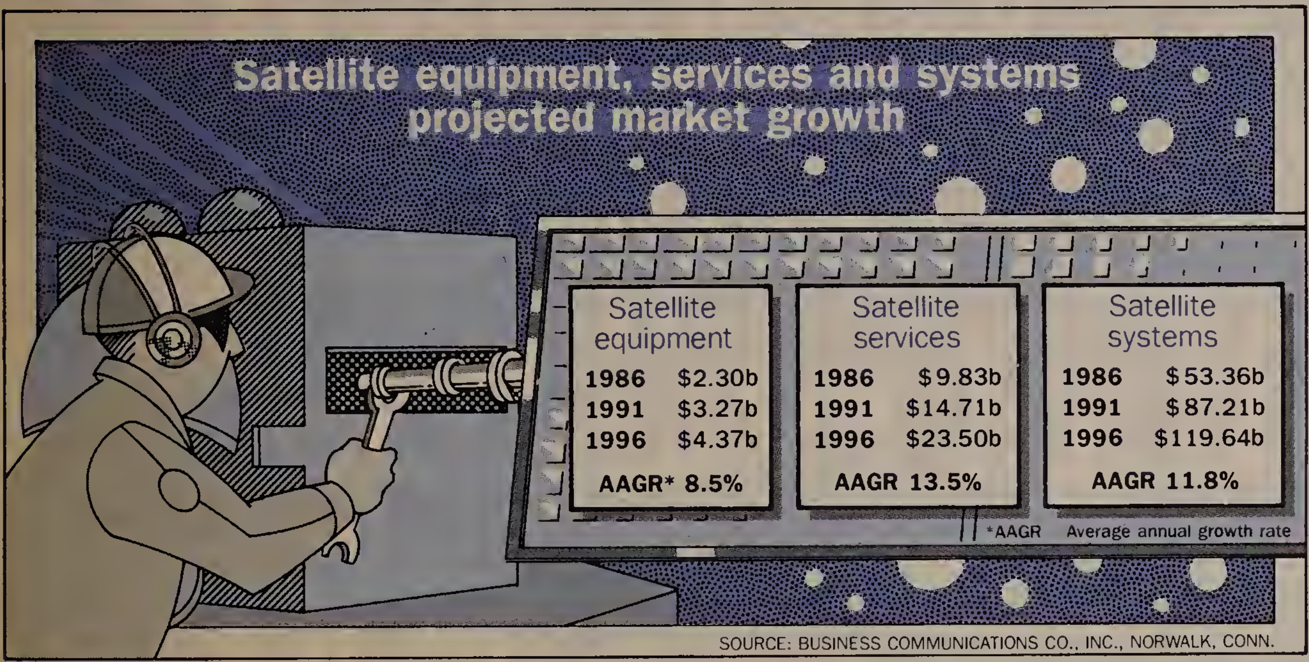
BY BOB WALLACE
Senior Editor

WAYNE, N.J. — With its three-man staff overwhelmed by managing and controlling a nationwide voice network, Formica Corp. handed that job over to US Sprint Communications Co., which replaced the company's AT&T WATS service with a cost-cutting virtual private network.

A US Sprint five-person national accounts team will shoulder the bulk of Formica's network management and control responsibilities and will work with Formica staffers to optimize the firm's 12-site communications net. Using US Sprint's Virtual Private Network (VPN) service, Formica will save $25,000 to $40,000 in communications costs each month.

In software-defined networks such as US Sprint's VPN, the service provider programs software in its network switches to

See **Formica** page 12



SOURCE: BUSINESS COMMUNICATIONS CO., INC., NORWALK, CONN.

▶ NARUC REPORT

Audit slams Nynex accounting policy

BY JOSH GONZE
Staff Writer

WASHINGTON, D.C. — Nynex Corp. may be improperly allocating costs between its regulated and unregulated enterprises and may be diverting telephone company resources to enhance corporate profits at the expense of ratepayers, according to a recently released report from the National Association of Regulatory Utility Commissioners (NARUC).

The report, which was prepared for NARUC by the Office of Accounting and Finance at the New York Public Utilities Commission, also argued that the regional Bell holding company failed to adequately compensate its regulated subsidiaries for personnel or services transferred to competitive ventures.

The audit report — the last of a series of RBHC audits conducted at NARUC's request — condemned Nynex's practice of withholding financial information on unregulated subsidiaries from auditors. The report, however, did not accuse Nynex of violating any regulations or the Modified Final Judgment.

The report stated, "The integration of monopoly and competitive services within Nynex is disturbing," adding that Nynex "dictates policies that may not be in the best interests of New York Telephone/New England Telephone and their ratepayers."

A Nynex spokesman denied the report's findings, saying, "Anything that has been done by Nynex has been fully reviewed by whoever it had to be reviewed by. There have been no activities that the regulating agencies are not aware of."

According to the report, Nynex's practice of allocating costs on the basis of relative size benefits nonregulated ventures at the expense of the telephone companies. The report states that the practice "assigns approximately 85% of corporate costs to the regulated affiliates, and it is

See **Nynex** page 12

CROSS TALK

BOB WALLACE

ISDN service takes its first baby steps

Users should not misinterpret the series of ongoing Integrated Services Digital Network field trials to mean they can rush down to their local or long-distance carriers and sign up for ISDN service today.

ISDN will not be made available until vendors determine what services users want and how to provide those services at a profit. Station equipment manufacturers will not commit to full production of ISDN gear until they get a much clearer picture of the potential market for this equipment.

Much of the talk at the recent 12th International Switching Symposium in Phoenix centered on the virtues of ISDN. The Bell operating companies paraded their ISDN users and described their respective field tests in deep technical detail.

But there was painfully little discussion of when services built on ISDN foundations would become available to users.

This is because the ISDN field tests are learning experiences for all participants. The RBHCs are learning how to market ISDN to users in their multistate regions. The BOCs are gleaning from the users what features ISDN services should or should not support. The station equipment vendors are learning how their prototype gear operates and what physical qualities the equipment should have once it is produced on a commercial basis.

In a majority of the BOC-initiated field tests, only the central office switch is being manufactured on a full-production basis. The ancillary software that helps the switch deliver ISDN service is largely experimental. And the lion's share of the station equipment is prototype gear as well.

Class 5 central office switches are the workhorses of the current series of ISDN field tests. It follows that when ISDN offerings are introduced to users, these same switches will provide the services. Users should press the BOCs to determine if and when smaller central office switches will be drafted for ISDN service.

One ISDN user explained ISDN service could only be extended to locations within a two-mile radius of the serving central office in the field test. Users should also ask the BOCs whether these distance constraints exist and if they will be eliminated.

And what about users with locations dispersed throughout a state or nation? Will smaller user locations, currently served by small central office switches, have ISDN functionality extended to them? Large user companies will likely be able to draw ISDN from central office switches in medium and large metropolitan areas, but may have to search for other telecommunications schemes for smaller branch office sites.

There are many additional questions that must be addressed by the BOCs before any ISDN service is offered. They include: What specific industries could use the service? What are users willing to pay for the service? What will station gear cost once it is produced in quantity? How will the service be tariffed?

Users can save their "I want my ISDN" cries until these and many other questions concerning the delivery of ISDN services are answered. ☑

▶ REGULATIONS

CPUC forces PacBell to slash rates by $191m

BY MARY PETROSKY
West Coast Correspondent

SAN FRANCISCO — The California Public Utilities Commission (CPUC) recently ordered Pacific Bell to slash its rates by $191 million — more than twice the rate cut the Bell operating company had expected the CPUC to request — beginning May 1.

As part of the rate cut, the CPUC required Pacific Bell to reduce the access rates it charges AT&T by $20 million. The rate cut stems from a CPUC investigation late last year into the impact of inflation and other economic factors on the telephone company's anticipated 1987 financial results ("CPUC pushes PacBell to slash rates," *NW*, Feb. 2). The BOC had initially thought the CPUC would order a total rate reduction of about $76 million, said Pacific Bell spokesman Jerry Batey.

The CPUC ordered the review of Pacific Bell's financial data to determine "whether Pacific Bell was unduly benefiting, at ratepayer expense, from lowered inflation, interest rates and bond cost levels," the CPUC noted in a prepared statement.

Batey said users will see a reduction in their monthly bills beginning May 1 and continuing until the end of 1987. He added that AT&T will receive a credit that can be applied to future Pacific Bell access bills.

He said Pacific Bell believes the rate reduction is based on a "flawed" formula that gives an unbalanced picture of the company's revenue and growth while underestimating its expenses.

Formica from **page 11**

route traffic according to user requirements in what appears as a private network.

The switch software also supports advanced features, including special dialing and routing capabilities. Formica's sites are linked to US Sprint facilities through the Bell operating companies, although the company may eventually employ dedicated access to the long-haul carrier switch.

Formica would not divulge the cost of its Virtual Private Network.

Bob Patek, senior systems programmer for Formiça, said the US Sprint national accounts team includes a national accounts manager and four dedicated technical staffers.

Nynex from **page 12**

doubtful this broad formula accurately assigns costs in relation to benefits." The report suggests Nynex develop a more direct formula for correlating cost allocation and subsidiaries' contribution to Nynex.

The spokesman defended the cost-allocation policy, saying, "Each of the companies is charged for services based on their relative size. That's something that the PUC has allowed us to do."

According to Richard Marshall, one of the report's three authors, savings from volume-purchase discounts and economies of scale have not been properly credited to regulated businesses. "All of the savings related to purchases by the regulated affiliates weren't being passed back to those subsidiaries. They were being passed on in the form of profits to Nynex," he said. The report added, "The company's integration of monopoly and competitive activity has the potential to divert economies generated by the monopoly segment to the benefit of nonregulated operations. The institutional framework allows economies of scale to increase corporate profits."

The NARUC report claims compensation "to the telephone companies for personnel or services provided to affiliates is generally inadequate." The report cited the shift of the directory advertising service to an unregulated affiliate as an example of a poorly compensated transfer. "We don't feel the regulated enterprises are getting a fair shake," Marshall said.

The Nynex spokesman countered, saying, "The new lines of business that Nynex has gone into have been set up in independent companies so that the shareholders are the ones that bear the risks or rewards of those businesses."

The report concludes that the lack of financial information on Nynex's unregulated companies makes full regulatory oversight impossible. RBHC policies for reporting finances of unregulated companies "have been a problem throughout the audits," according to Caroline Chambers, a spokeswoman for NARUC. She said NARUC supports legislation that would require these records to be available to regulators.

The T1
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"US Sprint's national accounts team will serve to augment my staff," Patek said. Formica's voice communications staff consists of Patek and a pair of assistants who operate the firm's private branch exchanges and handle station moves, additions and deletions.

"Network traffic reports developed by US Sprint will help me perform traffic analysis studies," Patek added. These vendor-generated reports will be especially helpful in showing the traffic generated at Formica sites that use key telephone systems, he said. Before the company signed on for VPN service, Patek said Formica staffers were fighting a losing battle to control network costs. "We were not doing a very good job managing telecommunications costs at all. And we did not have a central point of network control," he said.

Since the company was unable to adequately monitor the calling patterns of its sales, manufacturing and warehouse facilities, the locations were equipped with AT&T WATS Band 5 service — the most expensive WATS band available — which enables subscribers to call any point in the nation.

"We couldn't perform a study to find out what specific bands the different locations needed. So we ended up giving everyone Band 5 WATS service," Patek related.

Formica chose US Sprint VPN over AT&T's Software-Defined Network Service and MCI Communications Corp.'s V-Net virtual net offerings because there were no setup or administrative charges associated with subscribing to VPN. Patek said the other services include these ancillary costs.

According to Patek, Formica was put off by offerings laden with additional costs. "Every vendor wants to come in and design your network for you and then bill you for the time required to program their network switches to accommodate your network," Patek commented.

"If we were a big company with hundreds of sites, $50,000 or $100,000 for network design would be nothing. But network design represents a substantial expense to us."

Although virtual networking services offer a variety of calling features to subscribers, Formica has, for the time being, opted to employ only a few. One of the features Formica did select is the seven-digit VPN dialing plan.

"We didn't want our end users to have to worry about what band they might need to make a certain call. We simply wanted to make it easier for Formica employees to call one another," Patek said.

Patek chose not to make use of an option that would have enabled him to access the US Sprint data base in which network design information is stored. That feature is designed to simplify the work involved in reconfiguring a voice net. Formica users will reap the benefits of the service's travel card program, which enables users at locations not linked to the virtual network to dial an authorization code and the seven-digit network number to reach an end user on the network. ◩

▶ FTS 2000

Tymnet to join team for net bid

WASHINGTON, D.C. — Martin Marietta Corp. last week signed an agreement with Tymnet/McDonnell Douglas Network Systems Co. that calls for Tymnet to provide packet-switching service for the Martin Marietta team bidding for the $4.5 billion Federal Telecommunications System (FTS) 2000 contract.

Under the agreement, Tymnet would provide packet switching between local access and transport areas throughout the network. In some areas, Tymnet may provide its packet services within LATAs.

The Martin Marietta team already includes MCI Communications Corp., Northern Telecom, Inc., Southern New England Telephone and all seven regional Bell holding companies.

"One of the major services being asked for with FTS 2000 is packet switching. Today Tymnet is the largest provider of packet services to the U.S. government. By bringing them onto the team to help us meet one of the critical aspects of FTS 2000, they've become a major addition to us," said Jerry Thames, Martin Marietta's vice-president of communications systems and program manager for the FTS 2000 contract bid.

FTS 2000 will replace the federal government's current communications system and provide a national network for voice, data, videoconferencing and other services. An estimated 1.3 million end users will be supported by the new network. The General Services Administration issued a request for proposal on the FTS 2000 contract last January and plans to select a contractor at year end. ◩

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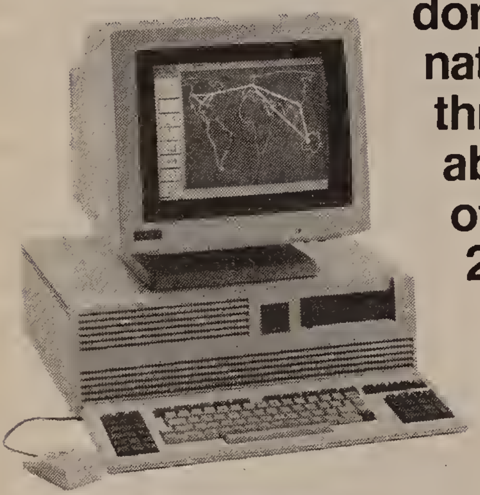

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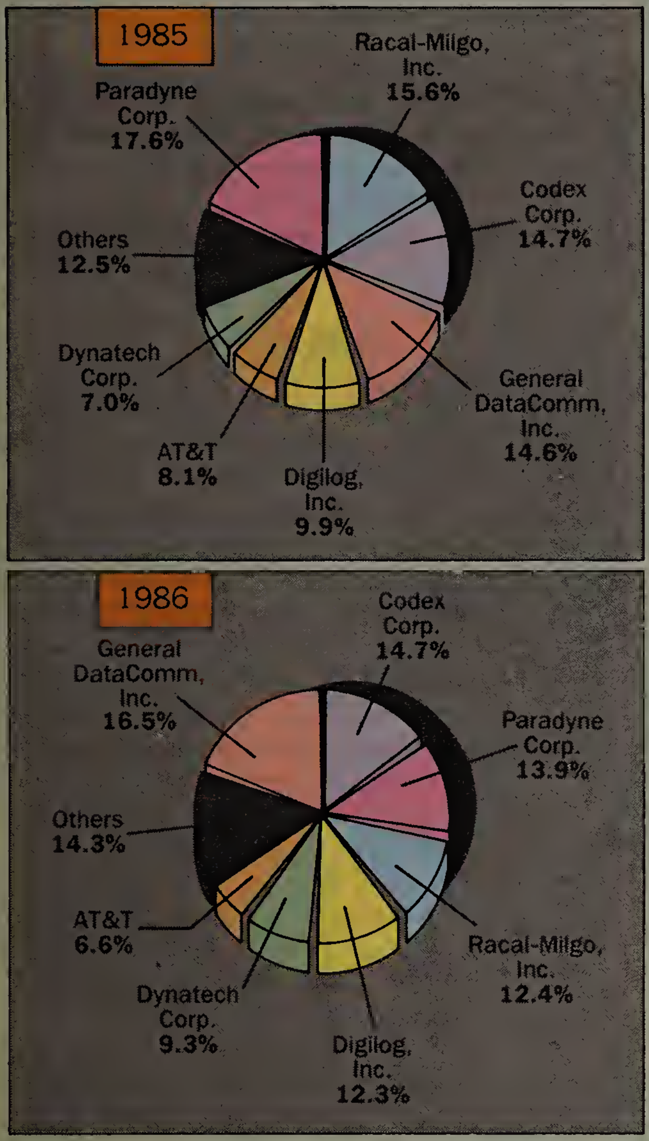
>
> **Rudolf Strobl**
> Senior consultant
> Arthur D. Little Co.
> Cambridge, Mass.

Network management revenue shift



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

▶ INTERVIEW

IBM insider provides insights into SAA

IBM last month unveiled a broad architectural outline, Systems Application Architecture (SAA), that will enable programmers to develop applications that can run on IBM Personal Computers, System/3X and System/370 mainframes. SAA is IBM’s attempt at addressing an oft-repeated shortcoming, that of software incompatibility across its major hardware lines.

SAA consists of four components: common applications, common user access, common programming interface and common communications support.

Recently, Network World *Senior Editor Paul Korzeniowski talked with John Friedline, manager of software marketing at IBM, about SAA and its probable evolution.*

Why did IBM decide it needed an architectural outline such as SAA?

Historically, application programmers developed vertical applications optimized for one piece of hardware and its operating system, data base and communications capabilities. For example, certain applications run on the Personal Computer; others operate on a System/3X. As we move to the 1990s, this application development approach will change, and programmers will write horizontal applications that span different architectures. To achieve this goal, IBM had to design an architecture to meet the needs of application programmers. Also, application programmers are a scarce resource, and we had to make them more productive. Third, communications protocols have to support systems that talk to one another as intelligent devices, not dumb terminals. Finally, we needed a set of guidelines to ensure that when users bought programs, they would perform consistently on different processors.

How will current IBM products evolve to support SAA?

Let’s take one example: communications functions. On a mainframe, they are supported by VTAM. Communications functions are built into the System/3X operating system and are extensions to a Personal Computer’s operating system. Such differences will continue to exist. However, we will add high-level programming services on top of the communications services to provide such things as peer-to-peer program-

See **Insider** page 16

DATA DIALOGUE

PAUL KORZENIOWSKI

SAA is center of speculation

So what gives here? IBM’s Systems Application Architecture (SAA) represents the company’s most important strategic direction since Systems Network Architecture debuted more than a dozen years ago.

Despite SAA’s importance, IBM unveiled it quietly. The company did not hold a formal press conference, mail out any press releases or supply SAA information to the various wire services.

Instead, the announcement was mailed to a select group of analysts and customers. IBM has taken a similar low-key approach with a few other announcements, but those typically dealt with enhancements to older products that the company was phasing out.

Why IBM chose to introduce SAA in this manner is a mystery, one that even IBM insiders were unable to unravel.

First things first. The task of implementing SAA will be Herculean, and analysts believe IBM will tackle the job in a piecemeal fashion. Dale Kutnick, executive vice-president at Stamford, Conn.-based Gartner Group, Inc., predicted that the first SAA item developed will be a single-user interface, and second will be a more consistent implementation of LU 6.2. Next, IBM will choose a single application programming interface, and finally, it will specify application development tools.

SAA products could be announced soon, but delivery is not expected until the end of the year at the very earliest.

What do you do for an encore? Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C. consulting firm, noted that SAA clarifies IBM’s application development direction. He predicted that the company could spell out another of its strategic directions as early as next month.

“IBM has to address the problem of packaging voice, data, graphics and video transmission in one data stream,” he said.

“There is no easy solution to that problem because there is no common standard for voice, data, graphic and video transmission.” ◪

▶ GOVERNMENT SPECS

Feds spell out OSI requirements

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — First there was MAP. Then there was TOP. Now there’s GOSIP, the Government Open Systems Interconnection Procurement specification. GOSIP spells out Open Systems Interconnect (OSI)-compatibility requirements for networking products purchased by agencies of the U.S. government, the world’s largest buyer of computer and communications equipment.

The U.S. Government OSI Users Committee began developing GOSIP late last year after Secretary of Commerce Malcolm Baldridge directed federal agencies to migrate to OSI-compatible equipment. The users group was formed to assist the OSI Implementors Workshop of the National Bureau of Standards (NBS) in defining OSI implementations that fit the needs of the federal information processing market.

GOSIP, completed in December, is designed to be consistent with Manufacturing Automation Protocol and Technical and Office Protocol. It is to be used by all federal agencies in purchasing computer and communications systems. The federal government hopes to use its $16 billion information systems purchasing clout to hasten the development of interoperable OSI-based products, said Robert Rosenthal, director of the NBS OSI workshop in Gaithersburg, Md.

The government believes the adoption of OSI standards

See **GOSIP** page 16

GOSIP from **page 15**

will allow it "to realize significant savings through reducing duplicate circuits and wiring, training, custom software, workstations and custom hardware interfaces," according to the GOSIP document.

In the past and even up to the present, vendor-specific versions of data communications protocols led to "isolated domains of information, very difficult and expensive to bridge," GOSIP states.

OSI standards allow the federal government "to move immediately to multivendor interconnectivity without sacrificing essential functionality already implemented in critical networking systems," according to the Government OSI Users Committee.

The committee hopes agencies will be able to purchase OSI-based products by the end of this year, but the process could be slowed by a lack of testing facilities for OSI products.

Although the Corporation for Open Systems (COS) was formed to test products for interoperability and OSI compatibility, COS is still in the process of developing its tests and probably will not be ready for operation this year.

"We need some organization that will affix a seal of approval to products, like the [Underwriters Laboratories] symbol for electrical products," Rosenthal said.

He concluded, "It's possible NBS could do that for government users." ◘

Insider from **page 15**

ming support or cooperative processing support. So, an application programmer will write to the high-level programming services, which in turn will call either VTAM services or extensions to a Personal Computer.

Implementations of LU 6.2 vary on a Personal Computer, System/36 and CICS. Will SAA define a standard LU 6.2 implementation?

Absolutely. Currently, we have the building blocks for LU 6.2, but incorporating it into an application requires a lot of low-level programming, which is different for each system. Not only will SAA define a more consistent interface, but the interface will operate at a higher level than current interfaces.

Strategic items such as Distributed Data Management and Advanced Peer-to-Peer Networking were not included in SAA. Will they become part of the architecture?

Last month, we announced only Step 1 in a long journey. We only included those products that everyone agreed would be part of the architecture and that we knew could be implemented on all three types of systems within a reasonable length of time. We are looking at the items you mentioned. Clearly, we must add other items to SAA for data support and distributed processing. We are working on how to include them in the architecture.

A mainframe is much more powerful than a Personal Computer. Will IBM be forced to sacrifice functionality for consistency when implementing SAA?

Compromises are always a concern when developing an architecture that spans multiple systems. With SAA, we've tried to address items that can be implemented on all systems, but we've left room for extensions. In most cases, communications protocols can be implemented in a consistent fashion for all of our systems. However, we can't take a 3090 and make it act like a Personal Computer. Also, IBM intends to enhance products that run only on high-end systems.

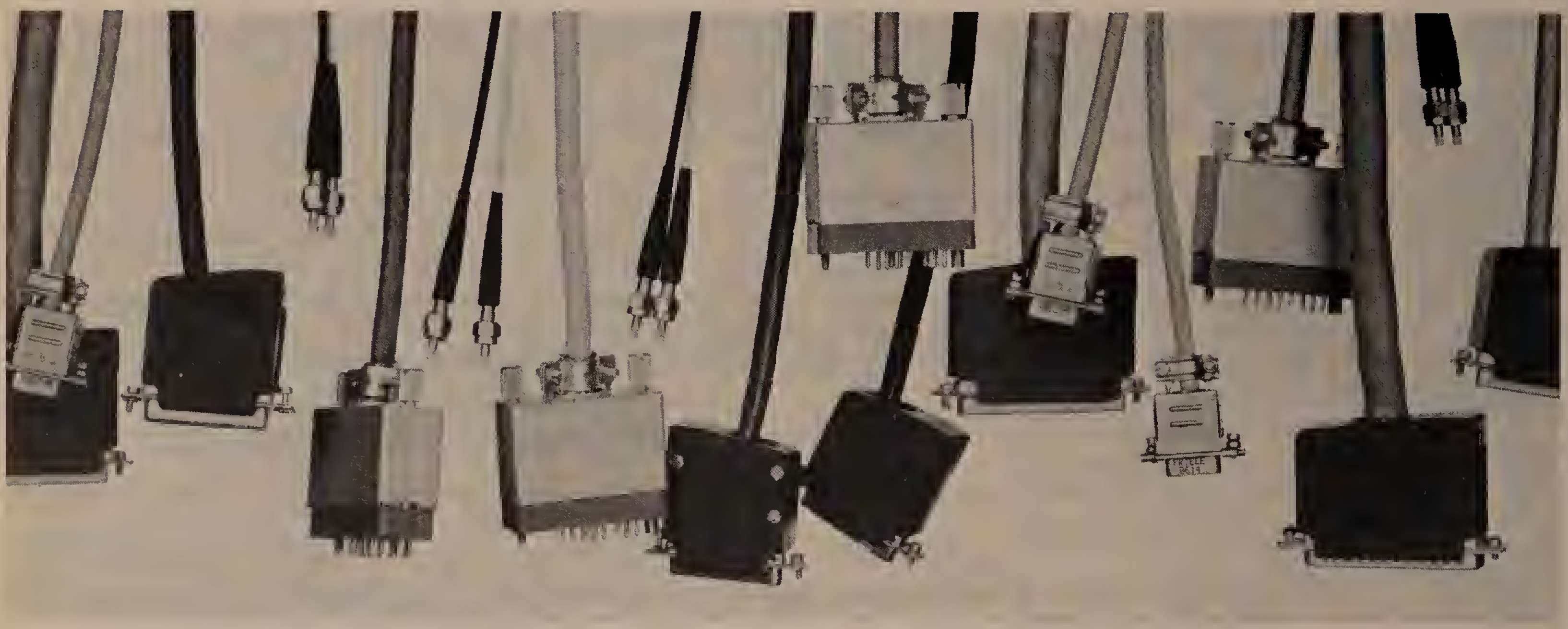
With SAA, we are building a set of bars, and our systems will be brought up to meet those bars, rather than vice versa. We will make our Personal Computers operate faster and increase their memory-addressing capabilities to more closely match large system capabilities.

What organizational changes did the company make to ensure SAA's success?

More than a year ago, we added a new organization to develop the architecture. A senior vice-president of programming is in charge of the group. Vice-presidents from various IBM divisions, called interface managers, are in charge of each of the four components. For example, the person in charge of end-user access is a vice-president in the Entry Systems Division, which makes Personal Computers, and communications issues are handled by a Communications Products Division vice-president. Even though vice-presidents come from different divisions, their responsibilities cross division lines. They have final approval for SAA specifications and new products.

Will SAA define how to invoke certain functions? For example, will a user be able to invoke a Help screen in any application by pressing a function key?

Yes. However, SAA would not limit the Help function only to PF key. Some users may prefer working with a mouse, and SAA would also define a method of invoking Help with a mouse. ◘



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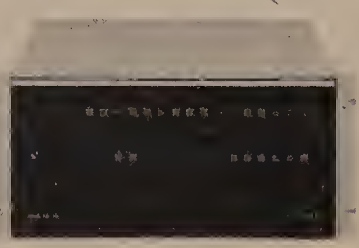

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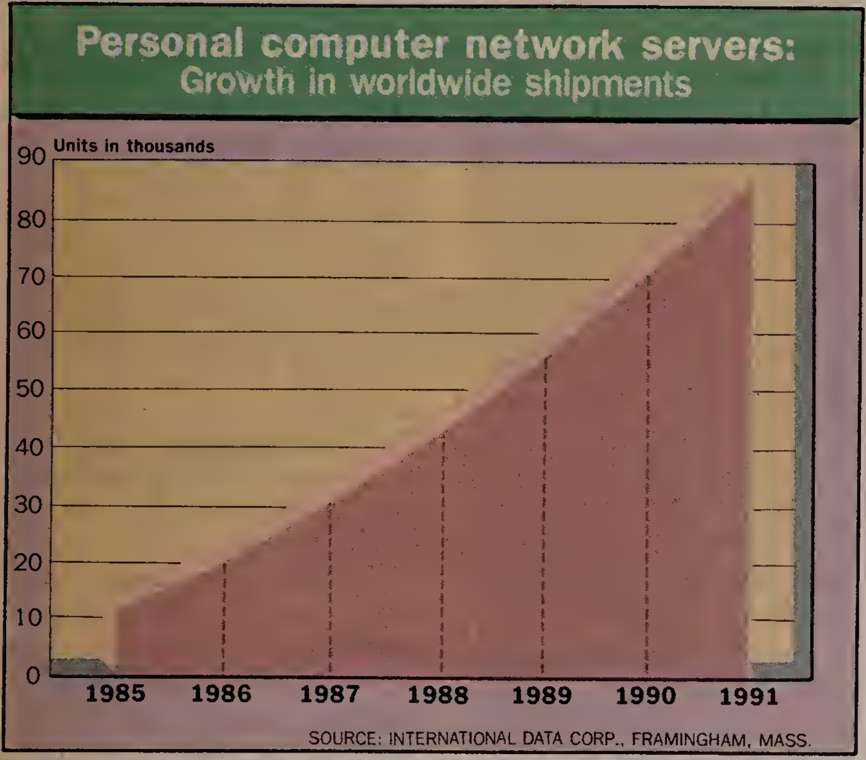
LOCAL NETWORKING

“AT&T hasn’t brought down prices on its Starlan adapters, but it will have to reduce them by at least half. The company’s cost to manufacture is much lower than its pricing reflects. By pricing the product out of reach, AT&T may choose to let the market pass it by.

Bob Newton
Program director, Local-area communications
The Gartner Group, Inc., Stamford, Conn.


Personal computer network servers: Growth in worldwide shipments

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

▶ NET BENEFITS

LANs help users manage micros

BY PAULA MUSICH
Senior Editor

Most companies buy personal computer networks to help end users share information or peripherals. But many microcomputer managers are beginning to realize another benefit of local networks: They can simplify the task of managing a company’s microcomputer resources.

Microcomputer managers say local nets help companies regain some control over personal computers. They also make it easier to distribute and maintain software, train end users, diagnose personal computer problems and standardize on software.

One of the most important management benefits local networks offer is that they centralize the maintenance of personal computer software. “With the network, it’s really easy to do an upgrade and to make sure everyone has received the upgrade. Its also much easier to provide support to everyone simultaneously,” said Paul Buckley, associate director of information systems at NORC (previously the National Opinion Research Center) in Chicago.

Steve Hoffman, a systems analyst with NBC Operations & Technical Services, a division of NBC in New York, concurred with Buckley. “For example, if Lotus [Development Corp.] comes out with a new release of 1-2-3, we can load it on the server once and everybody has it. Before, we had to install a new release in each user’s PC, and we’d invariably end up with a mix of releases that we were supposed to support.” Hoffman is responsible for managing personal computers at NBC.

Tim Ayres, office automation specialist responsible for overseeing local network operations at Hitachi America, Ltd. in San Francisco, agreed that local networks can cut down on the number of software versions with which managers must contend.

“I only have to maintain one copy of any given piece of software,” Ayres said. “It’s much easier doing that than maintaining 25 separate ones, especially if you have several printers that you have to configure, or if you’re working out the individual quirks in a new program.”

Personal computer networks also make it easier to establish and maintain standards for applications software, reducing the number of different packages the microcomputer manager has to support. “With the network, it’s easy to enforce standards. You can’t interface to the network if your software isn’t compatible with it,” Ayres said.

Establishing standards allows managers to resolve network problems more quickly. “When all the users have the same packages and they call you up with a problem, you know exactly what they’re looking at,” Hoffman said.

“We have eliminated a great deal of the software problems that we dealt with in the past because we know what our software does and how it works in the network environment,” Buckley said.

Standardizing software can also reduce

See **Local** page 18

LANMARKS

ERIC H. KILLORIN

Ethernet’s demise exaggerated

First it was baseband vs. broadband. Then it was contention vs. deterministic. Now, in yet another “Year of the LAN,” the debate has shifted to twisted-pair vs. coaxial cable.

Is there a pattern? Of course. Ethernet is the unfortunate target of comparison in these debates. Leaving no stone unturned, the pundits today have dredged up wiring as an argument for the demise of Ethernet when positioning it against the IBM Token-Ring net.

The original Ethernet specification called for coaxial cable as the physical means to link computers. But this is not cast in stone. Enhancements to the specification could accommodate virtually any medium that a clever hardware engineer could devise.

3Com Corp.’s Ethernet wizard, Bob Metcalfe, is orchestrating just such an endeavor. This summer, his firm is poised to announce twisted-pair versions of Ethernet that support the full 10M bit/sec transmission rate, and on unshielded copper at that.

Suddenly, we have the virtues of Ethernet on the low-cost wiring that IBM and AT&T are so eagerly promoting with their respective Token-Ring and Starlan networks. However, it does make one pause and wonder how this wiring can handle such speeds without turning the cable into a lightning rod. The vendors of line-conditioning devices are perhaps in for a brisk business.

The point of this argument is that local-area network technology is scarcely past the first generation. We’re still dealing with products that are based on years of development and have only seen minor tweaking in the past 18 months. It is not realistic to say that Ethernet will be pigeonholed as a high-cost, bottleneck-ridden local net because it doesn’t do what IBM’s Token-Ring does.

Two electric guitar standards, the Fender Stratocaster and the Gibson Les Paul, provide an interesting parallel to the Ethernet vs. Token-Ring argument. The “Strat” feels like a third arm and is a model of simplicity. The Les Paul, by contrast, feels like a surfboard and is a curious mixture of timeless sound with yesterday’s engineering.

Still, the Gibson has “that certain sound,” just as Ethernet has “that certain market momentum,” and within those intangibles lies the enduring appeal of each. Everyone thought the physical attributes of the Strat would bury the Les Paul, but they didn’t — just as the physical aspects of the Token-Ring won’t stamp out Ethernet.

So the paper specifications and all the hypothesizing about signaling, bit rates, wiring and channel access protocols in the local network business are potentially moot. There will be instances where Ethernet just plain makes sense, and this will be equally true with the Token-Ring.

Local-area network planners must examine the total picture, and only then can they make a shrewd local net acquisition. These decisions won’t be simple because, in many instances, they’re not quantitative, they’re qualitative.

Both local net approaches are evolving, and we’ve even seen some reengineering of the retransmission portion of the Ethernet protocol to make it more responsive under heavy traffic loads. This, coupled with the eventual use of optical fiber as the medium of choice for all local net installations, may bring the two networks on an even keel.

Then there won’t be any stones left to turn, and network acquisitions will be made on that oh-so-intangible aspect that governs our own buying decisions: instinct.

Remember, corporations don’t buy local-area networks, people buy local nets for corporations. ◘

Killorin is the publisher of “PC Netline,” a newsletter on computer networks. He is also president of Hyatt Research Corp., a data communications market research firm based in Andover, Mass.

Local from **page 17**

the work involved in getting applications to work correctly with peripherals. "You can really standardize on how the packages — especially word processing packages — work with peripherals on the network," said Laurie Antonell, micro networks manager at Merrill Lynch & Co., Inc. in New York.

"All the default settings can be set up once and explained once to users," Antonell said.

But settling on standard software packages is no easy task, Antonell added. It takes a great deal of time and thought to determine which applications can adequately serve the needs of all users.

"You need to spend some time on standardizing because you want to minimize the number of exceptions to the standards you set up," she said.

End-user training is also made easier on a network, both because the number of applications users must be trained on can be reduced and because interactive training programs can be set up on the network.

"You can use the network for computer-based interactive training," said Hitachi's Ayres.

Buckley of NORC, makes extensive use of this benefit. "Users' logon messages tell them there's a demo available on the network for a new program. It also tells them how they can [access the demo over the network] so that it just runs right in front of them."

Buckley uses this capability to pilot-test applications on a trial basis. If he subsequently brings a program in-house, he uses the network to let users know how to get more formal training in how to use the program.

"I can advertise formal training through the network and know that I'm getting to the users directly because the message shows up when they log on," he said.

"Then, the training itself will be done using networked machines so that everyone will be using exactly the same software at the same time. The network greatly simplifies the business of looking for something new, choosing the right package, bringing it in, setting it up and getting everyone familiar with it," he said.

Setting up local networks has helped NBC's Hoffman reduce the amount of training he has to oversee. As each network is installed, one person in the work group is assigned the role of network administrator.

"The administrators take some of the weight of support and training onto their shoulders," he said. His department does, however, train these administrators.

Easy problem diagnosis

Diagnosing personal computer problems is another area that Buckley finds is simplified because of the network.

"You can eliminate whole classes of problems in a central location," he said. "We can diagnose problems with individual PCs because we can duplicate everything on another machine on the same network and not have the problem. That makes it quick and easy to say the problem is in your machine," he continued. "You narrow it down very quickly because you eliminate a lot of the variables."

Not all microcomputer managers find this to be true, however.

"Troubleshooting is one area in which problems are increased because the network interface adds more unknowns — the adapter cards and cabling increase the complexity of troubleshooting," Ayres said.

While he said he believes the network has simplified some of his responsibilities, "it is a double-edged sword," Ayres said.

"It does reduce the amount of time involved in maintaining personal computers, but the trade-off is the network issues you deal with instead." ☐

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In recent months, ads for networking software have all begun to sound alike. Each promises a unique solution to your networking problem (even before the vendor knows what that problem really is). Each tells you the product is easy to use (that is, of course, if everyone is thoroughly trained). And that when you buy the product, you'll get all the technical support you'll need (but they don't tell you how long you must wait to get it).

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> “Corporate life doesn’t end at age 50. In a trend beginning in 1985, more U.S. corporations are hiring managers age 50 or older. Among reasons cited are the emergence of older role models, such as Chrysler Corp. Chairman Lee Iacocca, the repeal of state laws mandating retirement at age 65 and the ambition of companies to keep up with international competition.
>
> **The Richards Report**
> Wellesley Hills, Mass.

▶ IBM REPORT CARD

Users find SAA promising, late

BY BOB HAMEL
Senior Editor

IBM’s recently revealed Systems Application Architecture (SAA) may one day make it easier to develop applications that can be ported to all IBM systems, but users say it will take a long time for IBM to get all the SAA pieces in place.

IBM’s SAA blueprint defines the software interfaces, protocols and other conventions that users and software developers can use in building applications that will work across future offerings in IBM’s Personal Computer family, System/3X and System/370 processor lines. Ultimately, SAA applications will be portable and will work together across different machine architectures.

While users told *Network World* they are pleased IBM has spelled out its strategy for bridging its computer lines through software, many said the announcement was long overdue.

Bob Norton, a business systems interface analyst for Framingham, Mass.-based Zayre Corp., said, “The announcement is six to seven years late. IBM has been talking integration and talking solutions for a long time, but they were all separate solutions up until now.”

Marie Dence, associate director of the northeast regional data center for the University of Florida, Gainesville, concurred with Norton. “At this point, the announcement seems too vague to be of any real help. By spelling out this

See **SAA** page 20

ASSOCIATIONS

Charles Van Sickle, vice-president, lease finance with AT&T Credit Corp., is among the scheduled speakers for the Electronic Tandem Network Users Group conference April 13 through 15 at the Four Seasons Hotel in Houston. Van Sickle will speak on how the Tax Reform Act of 1986 will affect buyers of communications gear. The conference will also feature a user panel on the topic of choosing, implementing and maintaining T-1 customer premises equipment.

The ETN Users Group is composed of telecommunications professionals using AT&T telecommunications equipment and the Electronic Tandem Network hard-

See **Associations** page 21

Practical uses for call accounting systems

- Allocate telecommunications costs by extension, project and account code.
- Evaluate efficient use of stations, switches and circuits.
- Analyze cost-effectiveness of long-distance services.
- Verify long-distance billing in detail.
- Monitor performance of customer service and telemarketing staffs.
- Maintain user, equipment and circuit directory.
- Track maintenance requests and work performed.
- Monitor and diagnose system malfunctions.

SOURCE: NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION, WASHINGTON, D.C.

▶ GENERAL TELEPHONE

Video training keeps Lotto up

BY BOB HAMEL
Senior Editor

LOS ANGELES — General Telephone Co. of Calif. is betting on a laser videodisc-based simulation system to train its technicians to keep the state’s lottery network on-line.

At the heart of the 4,000-terminal lottery network is a Tellabs, Inc. distributed data bridge linking telephone company central offices in the state to the California Lottery Commission’s data center. This network carries millions of dollars worth of lottery transactions weekly between ticket sales terminals located in 7-Eleven Food Stores and Arco Oil & Gas Co. gas stations and the data center.

“The IBM mainframe has to respond instantly and flawlessly,” explained Glenn Hunter, General Telephone’s media manager. “Troubleshooting the network requires highly developed technical skills and split-second judgment.”

Because the data bridge is critically important to transmitting the lottery number information, General Telephone cannot bring the

See **General Telephone** page 20

GUIDELINES

ERIC SCHMALL

Playing musical chairs may lead to harmonious work attitudes

Seasoned politicians acknowledge the wisdom offered in the aphorism, “Where you stand depends on where you sit.”

Roles, attitudes and actions within organizations are deeply affected by each member’s perspective. A unit manager will observe and interpret events differently than an analyst or technician. While their viewpoints may never merge, they can be more closely synchronized if each individual has an opportunity to view operations from another’s position.

Experiencing events from a fresh perspective offers a number of benefits. Switching roles, even for the briefest of periods, fosters greater appreciation for another’s interests. This engenders more cooperative, productive attitudes. Creative suggestions are generated as a natural byproduct of these experiences since the viewer of the new role sees things unencumbered by the dulling effects of routine. In order to extract the greatest benefit from an internal exchange program, the manager needs to institute several rules.

First, these opportunities need to be brief, scheduled stints of duty and need to be supervised by the person most experienced in the role. Second, after each such exchange, the manager should interview the visiting individual as soon as his experience has been completed to learn about another’s view of the job. Finally, the manager must actively participate as an equal member of the exchange team.

Although many managers reach their current positions through faithful service in the technical trenches of network operations, analysis or programming, a growing number of telecommunications supervisors have arrived through transfers from outside areas.

As colleges and universities develop telecommunications programs, more managers will arrive without the hard-knock experience that proves to be so helpful in understanding other staff members’ perspectives. It will do the new manager no harm to spend a day or two at the network operations console under the tutelage of his staff to answer user complaints and employ the tools of the telecommunications trade — many of which he has recommended — in real-life situations.

On the reverse side, the manager should invite selected staff members to his corner of the world to witness how decisions and policies are forged.

By attending various staff meetings, project teams, vendor negotiations and decision-making sessions, the nonmanagement professional will learn a great deal about the forces that affect a manager’s perspective and actions. He might not be encouraged by the constraints and activities limiting his supervisor’s world, but he will better understand the boundaries and opportunities within which his unit must work.

From these formal perspective-widening events, the manager and his staff will discover greater common interests and a deeper understanding of one another’s resources, needs and strengths.

This improved, wider base of knowledge will lead to more creative, coherent and cooperative efforts grounded in mutual respect for the roles each person plays.

Schmall is a network systems manager for an insurance holding company.

SAA from **page 19**

strategy, IBM is trying to cover a lot of areas and make up for a lot of years of going in many different directions. I applaud the concept and the direction, but if it is to work, it will be a giant effort," she concluded.

Robert Warner, director of technical services for MONY Financial Services, of Purchase, N.Y., sees SAA evolving in the same manner as did IBM's Systems Network Architecture.

SNA was announced in the mid-1970s and continues to be expanded, he said. "The SAA announcement was a positional statement," Warner said. "It defines where IBM is going and outlines a basic picture before the company is close to having SAA products on the shelf."

Warner said that once the application architecture is defined and in place, utilizing it would take time. "SAA will be easier for a brand new user with a new system to take advantage of," commented Warner. "For older IBM shops and large environments, it'll take time to migrate to new applications."

The new deputy director of academic computing at the University of Pennsylvania in Philadelphia, James Kerlin, agreed with Warner's assessment. "SAA is another SNA. I wouldn't expect to see SAA become a reality for a few years down the line. Based on the past history of IBM, it will be a while before they have any SAA documentation ready," he said.

In Norton's opinion, distributing documentation detailing the common programming interfaces, common communications support and common user access is important to SAA's success. "If the documentation is sufficient, the people working on different interfaces will have that common piece of paper from which to take their menu and screen orientation," he said. "It'll make the process of developing SAA applications much easier."

Norton also indicated that if his company "was looking to create a menu standard, this is the standard that we'd use." He said he does not expect IBM to be issuing any further SAA material for at least a year to 18 months.

According to George Dinardo, an executive vice-president for Mellon Bank, N.A., in Pittsburgh, the word "potential" best describes SAA.

In Dinardo's opinion, the SAA framework is a necessary first step for IBM toward achieving common application portability. "SAA will provide a lovely way to grow from small to larger systems, and we'll get far more useful applications out of software houses as a result," he said.

Users were divided as to whether the SAA announcement was a response to Digital Equipment Corp., which many analysts believe has adopted a strategy of providing software compatibility through a single machine architec-

General Telephone from **page 19**

network down to troubleshoot or do any training. Hence the need for a realistic simulator.

Mike North, president of North Communications, said his firm created a simulation of the statewide lottery network on videodisc. "It allows the trainee to act as though he is working with the network itself," North said.

The modules in the 25-hour training presentation contain sections on basic training, data bridge components, data communications fundamentals, and lessons on testing and bringing links on-line. The videodisc displays actual images of the bridge components, and the attached IBM Personal Computer is programmed with dozens of fault scenarios that it randomly combines to generate problems for the maintainer to solve.

"For example," North stated, "if lightning struck, and a lot of terminals were put out of commission, a maintainer could use the system's remote diagnostics to look at the whole network, checking what circuits are up and what the data flow is like between circuits. The maintainer can then logically isolate where the fault must be."

North contends the videodisc training will allow General Telephone to develop its personnel so that they are "60% to 70% of the way to becoming fully qualified operators before actually touching the real equipment.

"It's a real world experience," he added. A timer is set up on the screen, and the maintainer is presented with a problem scenario. The maintainer tries for a perfect solution, based on option choice, command and the time it takes to make the decision.

"The system keeps a complete record of where you've been and how much time you took in a session. A maintainer can't complete it until he has scored perfectly in every test," North said. "The Tellabs system has only been in service for five months. There's no way to train people how to troubleshoot on-line, because General Telephone doesn't know what kinds of trouble can happen."

Said North, "It's a great technique of simulating a $10 million computer system on a $10,000 workstation."

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ture. Dence said no. "It's a response to IBM users' demands," she said.

Dinardo disagreed, stating "There will be some software vendors that will want to kill IBM for this, but the ability to develop something on a family and have it run upside and down is absolutely what the IBM user needs," he concluded.

According to Zayre's Norton, "IBM's always been in the comfortable position of being in first place, of not having to be on the edge. That allows IBM to check the acceptance of a strategy, see what the standards of other products and vendors are, and then build an architecture for their systems and market it correctly." ☐

Associations from **page 19**

ware and software. The group has approximately 165 nationwide companies as members. The registration fee is $50. For further information, please contact Ron Maciejewski at (412) 562-4763.

ProTel, a San Francisco Bay Area group for professionals in telecommunications, is planning a program for May 6 entitled "Presentation Skills — How To Sell Your Ideas To Management." Sharon McElroy, of Dynamic Presentation Services, is tentatively scheduled to deliver the presentation. The meeting will be held at the Holiday Inn, Foster City, Calif., 1221 Chess Drive. The program will begin at 7 p.m. and costs $10 and $15 for members and nonmembers, respectively. Call (408) 227-5637 for reservations.

George Colony, president of Forrester Research, Inc., will be the keynote speaker for the Association of Banyan Users International's spring meeting, to be held April 22 through 24 at the Kona Kai Resort and Hotel in San Diego. Colony will discuss solutions for tying personal computers into the corporate information systems environment. For additional information concerning the three-day users meeting, contact Donna Staats at (612) 370-4795.

Joseph W. Timko, vice-president of AT&T, is the newly elected chairman of the board of directors of the Corporation for Open Systems (COS). Timko succeeds Thomas Chun, vice-president of corporate projects for Tandem Computers, Inc. William R. Johnson Jr., a vice-president at Digital Equipment Corp., will assume Timko's previous responsibilities as vice-chairman of the COS board.

The X12 Data Interchange Standards Association (DISA) recently awarded Roger Cadaret, past managing director of the Automotive Industry Action Group, the group's first excellence in EDI technology award. The award was presented at the February meeting of ANSI X12 in Phoenix.

Cadaret chaired the ANSI X12 management task force and helped form DISA, the nonprofit association that serves as a full-time secretariat to the X12 committee. Cadaret also has assisted several industry groups in implementing EDI programs.

Richard D. Gibson and Donald C. Loughry were recently named chairman and vice-chairman of the Accredited Standards Committee X3. The committee develops voluntary standards for information processing systems including recognition, magnetic media, data communications networks, programming languages and office systems. The committee is the technical advisory group for the American National Standards Group. Gibson, the manager of external standards, information technology for AT&T Communications, Inc., replaces Ed Lohse of Unisys Corp. as chairman. Loughry, standards manager for Hewlett-Packard Co.'s information networks group, assumed the vice-chairmanship from Gibson.

Gibson has participated in standards-setting since 1961, when he became active in the X3 Task Groups concerning data-link control procedures, keyboard design and coded character sets. Loughry has participated in standards development in both the X3 arena and in the Institute of Electrical and Electronics Engineers. He has been involved with standards for codes, interfaces, data communications and networking.

At its recent meeting, held in San Diego, The National Automated Clearing House Association (NACHA) announced the winners of its Payment Systems Excellence Award. NACHA, created in 1974, aids in rule-making, marketing and product development for automated clearing house-associated financial institutions. John F. Fisher, senior vice-president of the Banc One Corp., Richard V. Kelly, assistant treasurer with the Commonwealth of Massachusetts and Lester W. Plumley, a retired assistant secretary in fiscal service for the U.S. Treasury, were chosen for leadership in the development and advancement of automated payment systems. Sears, Roebuck & Co. and The Equitable Life Assurance Society of the United States were also recognized. ☐

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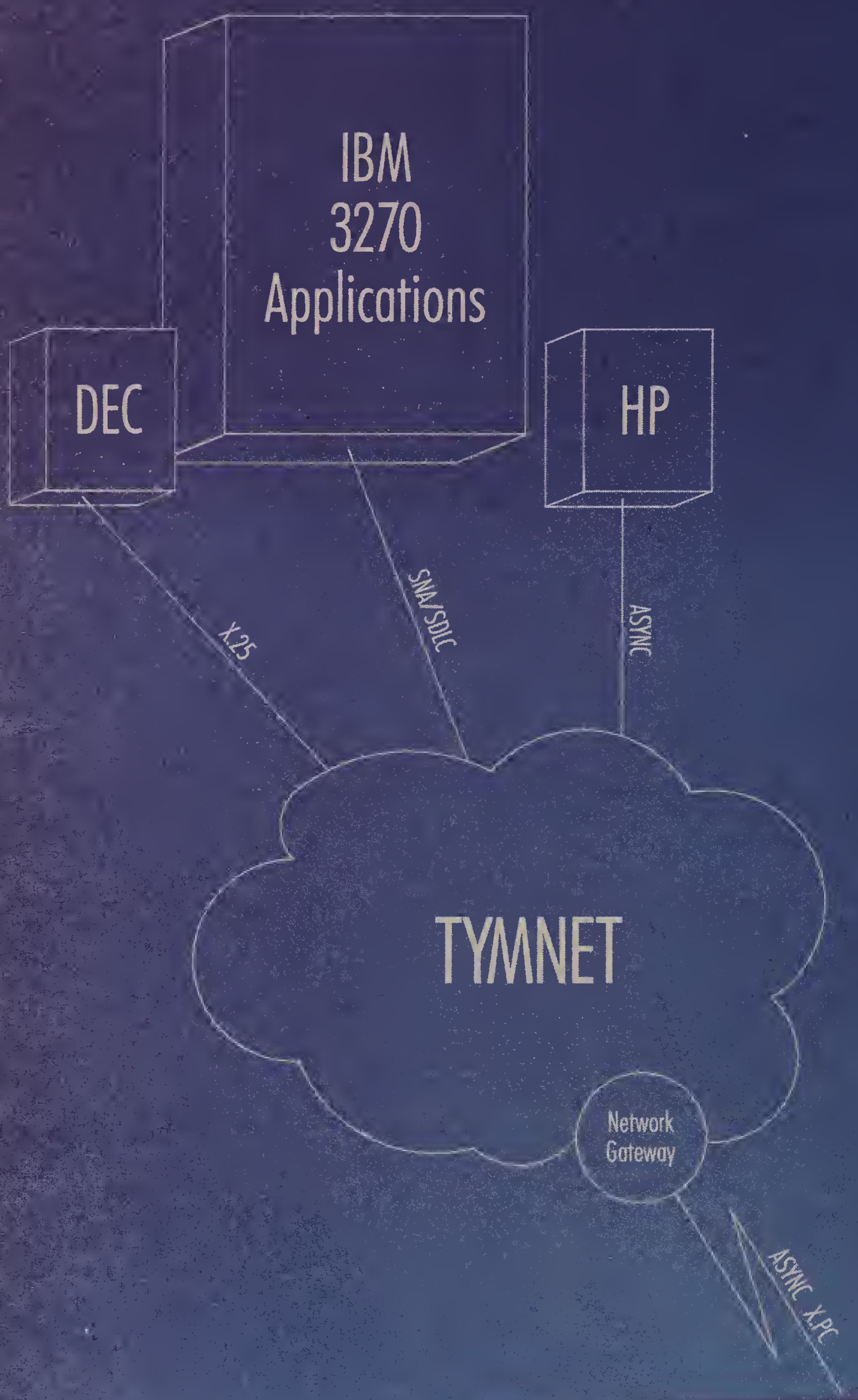

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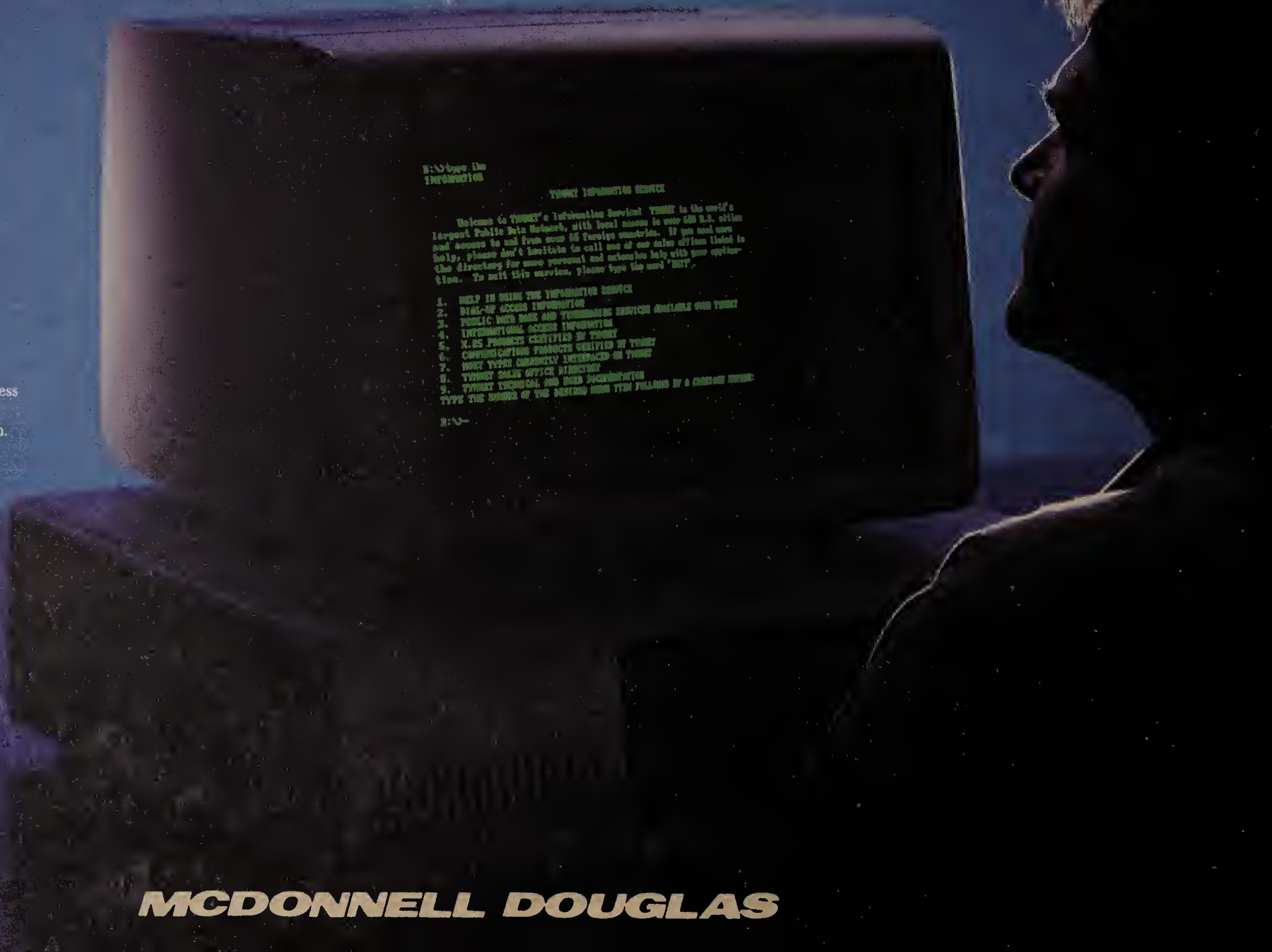

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- ▶ALS fiber-optic system
- ▶Gandalf's DEC link
- ▶Anderson Jacobson V.29 modem

▶CONTROL DATA CORP.

CDC boosts net capacity

Mac gets micro-mainframe link.

BY JIM BROWN
New Products Editor

MINNEAPOLIS — Control Data Corp. recently enhanced the file transfer capabilities of its Control Data Distributed Communications Network (CDCNET) and embedded a micro-to-mainframe link in its Network Operating System/Virtual Environment (NOS/VE) operating system for the Apple Computer, Inc. Macintosh. CDCNET, operating under NOS/VE, uses Ethernet technology to link terminals and workstations to Control Data hosts.

The announcements were made in conjunction with the company's introduction of the Cyber 180 Model 930 minicomputer, Control Data's first departmental processor.

CDCNET Release 1.2, which is reportedly based on the International Standards Organization's Open Systems Interconnect model, improves file transfers between hosts as well as local and remote terminals or workstations. The release also allows other vendors' hosts to communicate on CDCNET.

The new release will transfer files between local devices over the CDCNET connection. Files destined for remote devices are transmitted to a remote CDCNET over an X.25 public packet network using High Level Data Link Control.

CDCNET Release 1.2 also increases the number of terminals supported from between 64 and 500 to 5,000. These may include asynchronous terminals operating at up to 38.4K bit/sec as well as IBM HASP and 3270-type terminals using Binary Synchronous Communications.

Terminals and workstations attach to CDCNET through a microprocessor-based terminal device interface (TDI), while hosts link to the network through device interfaces (DI). Each TDI will now link a terminal to three separate CDCNETs or establish three paths over the same network, while a DI will now connect to multiple hosts.

CDCNET's new asynchronous pass-through function allows terminals to establish interactive sessions with other vendors' hosts. Control Data hosts can also use CDCNET to access IBM mainframes through IBM's Network Job Entry software. CDCNET initiates or receives a mainframe file transfer through a 3270 Binary Synchronous Communications line and passes it to IBM's Network Job Entry application on the host.

The firm also released a version of its NOS/VE operating system for the Macintosh that includes an embedded micro-to-mainframe link. That link, according to the firm, connects the Macintosh to a Cyber 180 system.

The products will be offered through Control Data's Computer Systems Marketing division, 8100 34th Ave. South, P.O. Box 0, Minneapolis, Minn. 55440 (612) 851-4131.

▶NETWORK MANAGEMENT

Codex enhances net control console

BY JOSH GONZE
Staff Writer

CANTON, Mass. — Codex Corp. recently announced enhancements to its high-end 4800 Series Network Management Systems, including a personal computer-based workstation that lets users control network components and generate management reports. The company also introduced a high-end multiplexer with switching capabilities.

Codex's 4800 Series systems are built on a 32-bit minicomputer and are designed to control medium-sized and large networks. Using Codex Management Applications extract software, users can download to the personal computer workstation information from the minicomputer that can be used to develop management data bases and customized status reports. Information can be fed into popular microcomputer packages including Lotus Development Corp.'s Symphony and Borland International, Inc.'s Reflex.

From the central personal computer console, the network manager can also control all Codex modems, Codex 6216 and 6240 multiplexers, and 6740 and 6760 statistical multiplexers. Using Microsoft Corp.'s Windows software running on the console, an operator can perform up to four net management tasks concurrently.

The new management console for the series is a Hewlett-Packard Co. Vectra IBM Personal Computer AT-compatible, which is the same hardware used in Codex's 9300 Series of low-end network management systems announced last month. The old operator interface for the 4800 Series was a CDX-268 terminal.

Users can also upgrade an existing Vectra or IBM Personal Computer AT to serve as the control console.

The 4800 Series enhancements are available for $8,000 or as an IBM Personal Computer AT or HP Vectra AT upgrade kit for $1,000. Software must be purchased separately for $4,000.

There are three models in the 4800 Series that differ in the number of lines and modems they support. The basic 4840 supports 248 lines and 2,200 modems; the 4850 supports double the 4840's capacity, and the 4860 supports triple the 4840's capacity.

Codex's 6015 Intelligent Network Processor (INP) multiplexer features asynchronous port switching with contention and queuing, which allows up to 16 terminal users to vie for four, 10 or 16 asynchronous ports, depending on the model. The 6015 INP works with point-to-point or Codex 6700 Series nodal processor applications.

6015 INP upgrades are added by plugging in terminal port and modem cards.

Pricing

The devices are priced at $1,500, $2,750 and $4,000 for four-, 10- and 16-port versions, respectively.

▶INTERFACE '87

Touch OSI software line grows

Offers MAP/TOP 3.0-based products.

BY MARY PETROSKY
West Coast Correspondent

LAS VEGAS, Nev. — Touch Communications, Inc. last week expanded its family of Open Systems Interconnect (OSI) software with the introduction of the first products based on the recently completed MAP/TOP 3.0 release.

The company also unveiled at Interface '87 here a version of the new software that can be downloaded from a personal computer to a personal computer network interface card.

Company officials said off-loading the Manufacturing Automation Protocol/Technical and Office Protocols to the interface card frees the personal computer from the burden of processing the protocols. Touch Communications, of Scotts Valley, Calif., will initially support 3Com Corp.'s Etherlink Plus Ethernet card with the new software.

In addition to 3Com's interface, Touch Communications plans to support downloading of its software to a variety of personal computer interface cards, said Dennis Morrison, cofounder and general manager of the company. Although the company is committed to providing so-called controller-resident products for the Token Ring (IEEE 802.5) and Token Bus (IEEE 802.4), Morrison said market demand would influence which network controllers are supported next.

Both the controller-resident software and the MAP/TOP 3.0 software products work on IBM Personal Computers and compatibles and are scheduled to be delivered in the third quarter. The 3.0 products will be an upgrade of Touch Communications' existing Touch OSI products, Morrison said.

Introduced last fall, these products are based on the MAP 2.1 and TOP 1.0 specifications and implement protocol Layers 3 through 7, as defined by the OSI model.

The products are currently available as software that runs on IBM Personal Computers and compatibles and the Digital Equipment Corp. VAX family; implementations are available for both Ether-

See **Touch** page 27

▶ FIBER-OPTICS

ALS debuts 16-channel transmission system

BY JIM BROWN
New Products Editor

WALLINGFORD, Conn. — American Lightwave Systems, Inc. recently introduced a 16-channel 715M bit/sec fiber-optic-based transmission system that is reportedly capable of transmitting uncompressed video channels or high-speed data or voice over a distance of 18 miles.

The FT-1300 system operates with 1,300 nmeter single-mode fiber-optic cable. It was designed to link videoteleconferencing systems, remote corporate data centers or broadband local networks.

Each of the system's 16 channels will support either a video channel, a 44.735M bit/sec T-3 digital data line, seven T-1 lines or a mix of frequency-division multiplexed channels running on a broadband local-area network.

At the heart of the system is the firm's FT-1301-TX lightwave transmitter, which converts electrical signals to a laser-generated optical signal. The FT-1302-RC lightwave receiver, used in short links, translates the optical signals back to electrical signals. The FT-1302-PRC lightwave receiver is used in links that reach the maximum distance of the system.

> The system can attach directly to a coaxial cable broadband local-area network to extend its overall length.

According to the firm, the system can attach directly to a coaxial cable broadband local-area network in order to extend its overall length. Because the system uses a diplex filter to break the broadband's two-way communications path for transmission over the fiber system's one-way communications path, extending broadband local-area networks requires a pair each of laser transmitters and receivers.

In order to introduce T-1 lines into the system, a third-party frequency-division modem is used to feed the electrical signal into an ALS-provided signal combiner, which the firm said combines signals from several modems for presentation to the transmitter. T-3 lines interface directly from a T-3 multiplexer to either the signal combiner or the transmitter.

The signal combiner will combine a mix of T-1 channels, T-3 channels, multiplexed video channels and broadband local-area network channels into a single signal accepted and transmitted by the FT-1301-TX.

In a videoteleconferencing environment, the system's FM-6200-VM modem feeds into the system a video channel, which is capable of supporting four audio subcarrier channels.

The FM-6020-AM modem combines one or two of the audio channels with the video signal. The FM660 multiplexer combines up to 16 video channels and transmits the aggregate signal over to the FT-1301-TX transmitter. The process is reversed on the receiving end.

The system also supports 70-MHz intermediate frequency interfaces, which directly link satellite and microwave transmission equipment to the system.

According to the firm, the system was tested by a Shell Oil Co. refinery in California, where it was used to link broadband local-area network segments.

Up to eight of the system's modular components can be housed in the firm's 1300MF mainframe chassis. The system also supports a status-monitoring module, the FT-1500-SM, which reports the operational status of other modules in the chassis to a remote network operator.

Used as a broadband local-area network extender, the system starts at $25,000. The price for interfacing each T-3 trunk to the system ranges from $16,000 to $20,000, while the cost of linking each T-1 line to the system is $5,000. A complete 16-video-channel system is listed for $96,000.

Support for T-3 capability will be available in July. Otherwise, system components are currently available. American Lightwave Systems is located at 358 Hall Ave., P.O. Box 1549, Wallingford, Conn. 06492 (203) 265-8880. ◻

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Products & Services

Multiplexer system, DEC link released

Gandalf Data, Inc. announced a system that wraps statistical multiplexing, X.25 line concentration, time-division multiplexing (TDM) and digitized voice trunking into a single unit. Also announced was a gateway that links its Private Automatic Computer Exchange (PACX) to Digital Equipment Corp. Unibus-equipped computers.

The **Mux 2000** multiplexer system consists of **KMUX, XMUX, VMUX** and **SMUX** modules, which fit into a MUX 2000 cabinet.

The $2,595 KMUX module is a seven-channel synchronous TDM designed for use with digital data links operating at speeds up to 56K bit/sec or 64K bit/sec. Acting as a packet assembler/disassembler, the XMUX module provides access to X.25 public and private packet-switched networks for up to 16 synchronous devices operating at speeds up to 19.2K bit/sec. The XMUX ranges in price from $2,195 to $4,695.

The $950 VMUX module is a two-channel voice and data TDM designed to link private branch exchanges. Using adaptive differential pulse code modulation, the VMUX digitizes and compresses speech into a 32K bit/sec digital data stream. The voice channel interfaces to a PBX over standard ear and mouthpiece lines. The VMUX data channel links to data terminal equipment or to other members of the MUX 2000 family.

The SMUX module is a renamed version of the firm's existing Switchmux statistical multiplexer, which transmits up to 16 19.2K bit/sec channels over a single 64K bit/sec composite link.

The firm's **VAX Gateway Server (VGS) 2518** allows the PACX 200 and PACX 2000 to link directly with DEC Unibus-equipped systems, including the PDP 11 and VAX 11-70 minicomputer series. The VGS 2518 is line-compatible with Gandalf's Line Miser 518 multiplexers and the Gandalf Line Miser 2518 multiplexers. The device supports asynchronous speeds up to 19.2K bit/sec over two four-wire connections up to 8,000 ft.

The VGS 2518 and PACXNET GLM 2518 come as a package and cost $2,945.

Gandalf Data, Inc., 1020 S. Noel, Wheeling, Ill. 60090 (312) 541-6060.

Anderson Jacobson debuts V.29 modem

Anderson Jacobson, Inc. introduced a V.29 modem operating at 9.6K bit/sec in point-to-point or multipoint environments.

The **AJ 9601-ST** provides full-duplex, synchronous communications over four-wire, unconditioned leased lines. It also offers an automatic adaptive equalizer to eliminate channel interference and delay distortion. The AJ 9601-ST can be configured with downloaded commands. A front-panel LED displays signal quality data.

In multipoint operation, up to 15 modems can be supported on a single line. The master modem can poll each slave modem individually, download configuration commands, initiate testing and monitor remote signal quality. Diagnostic tests that can be initiated from the front panel include local analog loop-back as well as remote digital and analog loop-back.

Available as a stand-alone or as a rack-mountable unit, the AJ 9601-ST is priced at $1,295.

Anderson Jacobson, Inc., 521 Charcot Ave., San Jose, Calif. 95131 (800) 423-6035.

Firm enhances PC remote job entry

Intelligent Technologies International Corp. enhanced its package that links personal computers to minicomputers and mainframes using Binary Synchronous Communications.

The **Bisynchronous Exchange 3780 Communications System,** which now operates under Concurrent DOS, makes personal computers look like 3780 remote job entry terminals to an IBM mainframe or minicomputer. The system's transfer speed was increased from 4.8K bit/sec to 19.2K bit/sec, and it will support personal computer-to-personal computer file transfers.

The product was reduced from $795 to $695. The system can be upgraded to one of the firm's SNA Exchange Communications Systems with software costing $495.

Intelligent Technologies International Corp., 737 Lincoln Centre Drive, Foster City, Calif. 94404 (800) 523-8396.

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Products & Services

PC-based POS application released

Advanced Concepts, Inc. released a point-of-sale package that works with Open Systems, Inc.'s line of business and accounting applications.

The product, **Advanced P.O.S.**, functions as a cash register and produces invoices, sales tickets and inventory records. Data collected by the package can be integrated with Open Systems' business, accounting and report generating software.

The POS package also maintains and controls online pricing data for other POS terminals. The product supports MS-DOS 3.1, Novell, Inc.'s Advanced NetWare 2.0, 3Com Corp.'s 3+, IBM PC Network and Xenix operating systems.

The package runs on an IBM Personal Computer AT or compatible and requires a 20M-byte hard disk. The package has optional interfaces to Indiana Cash Drawer Co. cash registers, Aedex Corp. bar code readers and 40-column sales receipt printers.

The package will be distributed through resellers and carries a suggested list price of $1,195, which includes source code.

Advanced Concepts, Inc., 4129 N. Washington Ave., Milwaukee, Wis. 53212 (414) 963-0999.

Tool provides POS, inventory control

Micro Business Strategies, Inc. recently announced a software system designed for point-of-sale processing and inventory control.

Dubbed **Sales Pro,** the software runs on IBM Personal Computers with 640K bytes of random-access memory as well as a hard disk.

The multiple-module menu-driven system can be used in a single or multistation networked configuration.

It provides cash drawer automation, inventory control, sales reporting, record-keeping and updating, customer data bases and varied administrative functions.

Designed for small to medium-sized businesses, the package pricing starts at $2,500.

Micro Business Strategies, Inc., Suite 103, 720 Avenue F, Plano, Texas 75074 (214) 881-1043.

Server links 10 terminals to Ethernet

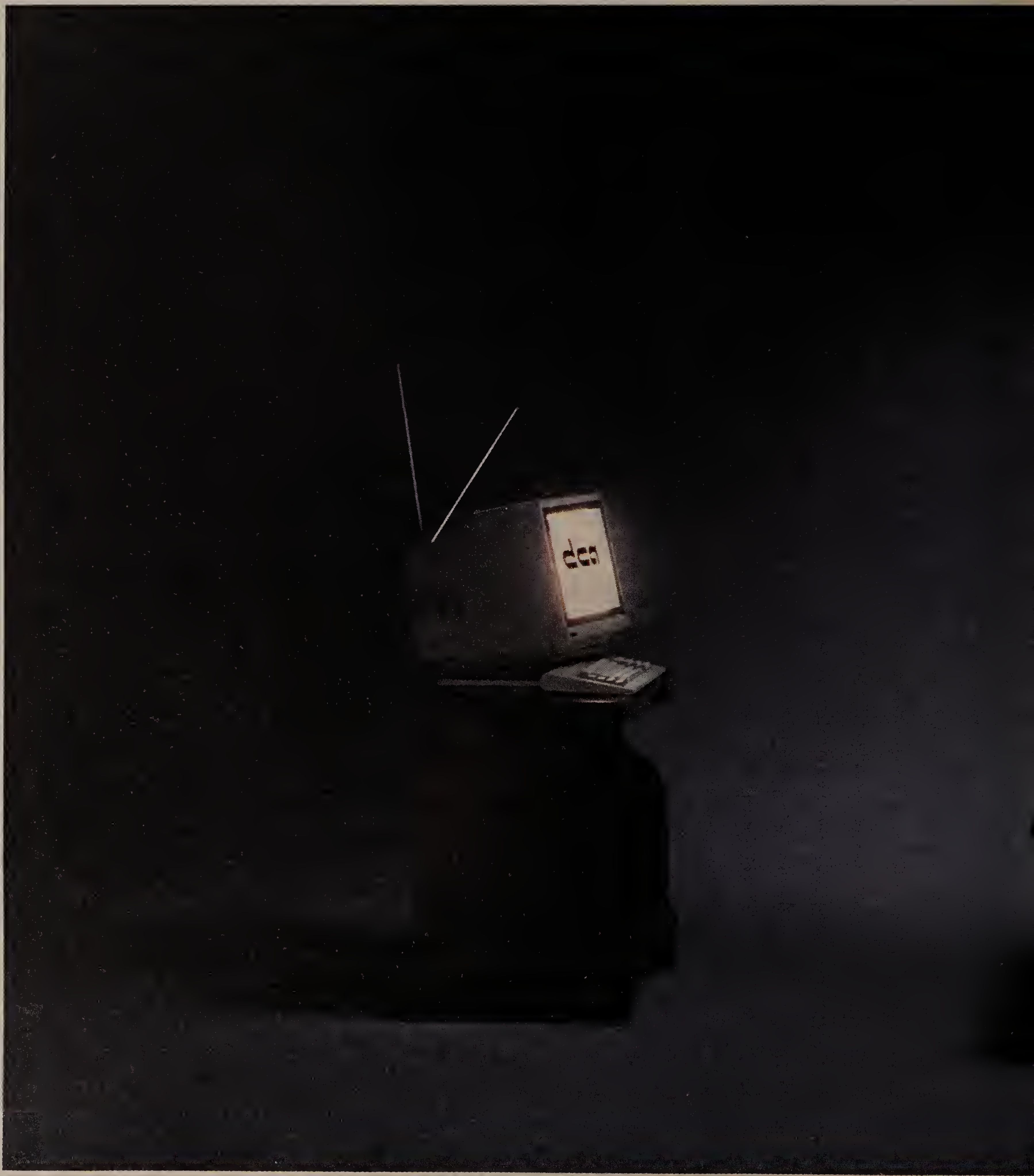
Communication Machinery Corp. introduced a network terminal server that links up to 10 asynchronous RS-232-compatible serial terminals to an Ethernet local-area network.

Supplied with communications software, the **Transerver** can be configured to operate as data terminal equipment or data communications equipment.

It allows attached terminals to access a modem for remote connections. The terminal's RS-232 cable is converted to RJ-45 adapters, which then plug into the server.

The server has an integral Ethernet transceiver that attaches directly to an Ethernet running Telecommunications Network (TELNET) virtual terminal protocol, Transmission Control Protocol/Internet Protocol, Internet Control Message Protocol or Address Resolution Protocol.

The server will also provide remote logon for Unix-based hosts. The Transerver ranges in price from $1,695 for a four-port version to $2,495 for 10 ports.



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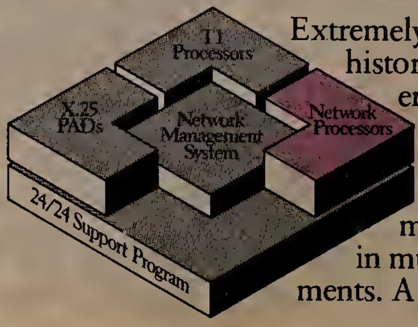

Extremely reliable, with a long history of satisfied customers, DCA's Series 300 Network Processors continue to set new standards for performance and connectivity in multi-vendor environments. A network configured

Products & Services

Communication Machinery Corp., 1421 State St., Santa Barbara, Calif. 93101 (805) 963-9471.

Board supports conference calling

Develcon, Inc. announced a data conference call capability for its data private branch exchange, Develnet.

The board-based facility, designated the **Model 7150,** allows groups of network subscribers to interact with one another over a shared connection or conference connection.

The firm says that, with the board, a system administrator can have terminal users join in a conference connection to learn new system functions or train as first-time users.

The board supports up to 32 simultaneous full-duplex connections and will support more than one concurrent conference as long as the total 32 connections are not exceeded.

Multiple boards, however, can be cascaded to increase the number of subscribers with access to a single conference call.

Password protection provides the conference originator with the ability to control access to the call and limit participants to read-only status.

The originator is also informed when participants join or leave conference.

The Model 7150 is priced at $4,000.

Develcon, Inc., Suite E, 6701 Sierra Court, Dublin, Calif. 94568 (415) 829-6200.

Touch from **page 23**

net and IBM Token-Ring Network-compatible networks.

MAP is a set of emerging and established standards that enable factory-floor equipment manufactured by different vendors to communicate over a single network. TOP standards are aimed at the broader office and engineering environments.

MAP specifies use of a broadband, coaxial cable-based, token-passing local network. TOP is based on Ethernet-type baseband technology and employs carrier-sense multiple access with collision detection instead of token passing.

Although the two networks differ at the physical and application layers, middle-level protocols are similar, Morrison said.

Partly to leverage these similarities, the individual groups working to define MAP and TOP protocols merged; the MAP/TOP 3.0 specification is the fruit of the two groups' joint effort to define a common specification.

The MAP/TOP 3.0 specification "is a tremendous milestone," Morrison said. "We really have a specification that meets users' needs."

The 3.0 specification differs from earlier MAP/TOP specifications in several ways. It offers an expanded File Transfer Access Method capability, including the ability to access files on a record-by-record basis; the new X.400 message-handling system; and a set of information exchange protocols that provide for the sharing of data between applications.

Pricing of Touch OSI to large end users and OEMs includes a licensing fee, which the company would not divulge, and is based on purchase volume.

The company said the products would cost, on average, $300 per personal computer.

around our Series 300 processors is flexible when you need to grow, reliable when handling the rare but inevitable problems associated with your long-haul transmissions, and management-oriented when it comes to operational control. And because Series 300 products are designed and built with modular, software-based components, you will never have to worry about obsoleting your initial investment. Put all this under the centralized control of DCA's integrated Network Management System–and under the two-year protection of our unique 24/24 support program–and you'll begin to see why DCA is the network everyone's watching. For the complete picture on DCA's Series 300 solutions and how they fit into our total networking family, call 1-800-241-4762* toll-free, ext. 515 today.

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INFORMATION SERVICES

C. WILLIAM REED

Here come the BOCs

A witticism making the rounds at cocktail parties these days holds that a person could easily be elected president on the platform of putting AT&T together again.

Nevertheless, the current administration shows no signs of rounding up all the king's horses and all the king's men to try to put the Bell System together again. In fact, the Federal Communications Commission's new scheme, Open Network Architecture (ONA), goes beyond the dismantling of AT&T to unbundle network access at its most basic levels.

The FCC justifies ONA in the name of efficiency and competitiveness. Yet no one has asked just who is supposed to benefit. It's become a cliche to say that users want instant and transparent service. But it's important to understand precisely who these users are in order to see how they will benefit from ONA.

The users of information services under ONA fall into two categories: intermediary providers and end users. Intermediaries are the information service providers: data base vendors and system operators such as Dow Jones & Company, Inc.'s Information Services Group, CompuServe, Inc. and The Source. Under ONA, this category could expand to include any company that wants to distribute information electronically to its employees, its clients or to other users.

End users are the individuals who need information. This category is reputed to be the true beneficiary of ONA. But it has supposedly been the beneficiary of every deregulatory scheme introduced in the past five years. And yet the market for consumer information services is still stifled by the same obstacles that existed five years ago: the high cost of network usage and difficulties in gaining access to information.

The intermediaries, or the information services providers, blame the telephone companies for not improving access to their network. The phone companies blame regulatory restrictions. Both sides now see the advent of ONA as an opportunity. For the information providers, it means better and cheaper network access; for the telephone companies, it's a chance to get into the information services game.

Intermediary users fall into two classes. Large intermediaries tend to have an established subscriber base and are as concerned with increasing the efficiency of reaching that base as they are with increasing its size. These companies will be the primary beneficiaries of ONA in the short run. They've built a business out of delivering electronic information, and the key issue in ONA is keeping potential competitors away from their users. Of course, we all know who those potential competitors will be: the seven Baby Bells and AT&T, all of whom have far more resources than the other information providers.

Small intermediaries, the new entrepreneurial market entrants for which ONA is supposed to create a market, have to create a customer base. They're looking for something different from ONA — lowered barriers to entry and safeguards designed first to get them into the field and then to preserve equality.

But there are now three categories of intermediary users, namely the behemoths (the BOCs and AT&T); the large companies, such as McGraw-Hill, Inc.; and the small companies, all with radically different interests.

Several organizations have suggested that a number of safeguards be implemented during a three-year trial period in which the BOCs would be allowed to enter the market but would be held in check. Safeguards would ensure the availability of equal interconnection, appropriate audit and accounting procedures, availability of network information and basic service elements. These would keep all players in the game long enough to determine whether the game is interesting enough to be played at all.

And that, after all, is the real issue behind ONA. Will end users, sitting behind their terminals, have better service, a wider variety of options and easier network access at cheaper prices? If ONA, with its safeguards, is quickly implemented, this will probably happen.

However, unless users and information service providers make themselves heard, the BOCs will probably drag their feet in implementing ONA until they can define it on their terms and establish a dominant presence in information services.

Reed is director of Research Services at Link Resources Corp., a New York-based market research and consulting firm specializing in information and communications services.

CAREERS

ROBERT S. BRAUDY

Weighing the risks

Why should a telecommunications manager take risks with his career in today's uncertain and turbulent environment? The decision to take a risk is intriguing; it is often based on the following factors:

- Political expedience;
- Professional pride;
- Professional recognition;
- Mandated action by senior management.

Unfortunately, many communications and business decisions are made before the risks have been fully assessed or the consequences of setting program objectives have even been defined and understood. As an example, one financial institution set as its objectives the upgrading of service and reduction of communications and other costs for its branch operations. Yet, neither a requirements document nor a quantitative statement of objectives was set prior to developing a new branch automation system. The firm unveiled a pilot of the new system, with different versions of the system to be installed in many branches. However, no methodology was established to track results of the trial.

While benefits were felt to be rather good on a visceral level, they could not be quantified under close scrutiny. Consequently, senior management became concerned and asked for a review of the project.

Two types of risks were involved in the decision to pursue this review, and in this, the case is not unusual. On one hand, there were the risks of having the project canceled or having its funding reduced if initial results did not meet planned targets within the stated time. On the other hand, there was the risk of losing market share and profits through inaction if the program was not funded.

To understand trade-offs and risks in decision making, one can consider three strategies, assuming the same level of service can be delivered under each strategy. The interacting variables that constitute this model are uncertainty, flexibility and cost. One strategy would be to decrease uncertainty while simultaneously increasing flexibility, but that is usually attained at an increase in cost.

It would be preferable, however, to minimize uncertainty, while increasing flexibility and decreasing costs. Is it possible for vendors to come up with this product/service mix? And by cutting costs in the network, is the communications manager sometimes shaping or limiting business growth? Astute managers must be aware of the effects of their choices on both communications strategy and business strategy.

The third strategy, aimed at maximizing flexibility, is also likely to result in both increased costs and uncertainty. It's quite unlikely that increased flexibility could be achieved along with decreased costs and decreased uncertainty.

Voice and nonvoice networking and systems integration of business, today and in the near future, demand that senior line-of-business management, MIS and telecommunications management pay increasing attention to the impact of their decisions on telecommuni-

Braudy is vice-president of Quantum Consultants, Inc., an information technology consulting firm and subsidiary of The Quantum Group International in New York.

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TELETOONS — By Phil Frank

So... what do you think of our Performance Monitoring System..

cations. Without acknowledgment from such key players, the risk of ultimate failure increases substantially.

There is no recipe for ensuring that major telecommunications decisions are brought before senior management.

It's difficult to present a clear assessment of risks, costs and short- and long-term impacts on the company, its key customers or its competition. Risk factors that must be considered when preparing the business case include:

- Performance. Will the proposed solution live up to expectations?
- Budget and date. Will the telecommunications department be able to deliver the promised service within or near budget and by an acceptable date?
- Flexibility. Given a dynamic business environment, will it be possible to modify the network in response to business requirements without incurring a significant increase in operating costs?
- Vendor staying power. The recent retrenchment of MCI Communications Corp., which no longer supports Datatransport, its public packet service, and US West, Inc.'s withdrawal from providing customer premises equipment to customers outside its 14-state region, are prime reasons for concern.
- Standards. What is the balance between vendor de facto and industry standards?
- Architectural lock in and lock out. In selecting one architecture, what are the difficulties and costs associated with interfacing to different network and system architectures?
- The possibility of tariff increases.
- Single and compatible vs. multiple and potentially incompatible products. How can networks be managed in such an environment?
- Substantial nonrecurring costs in setting up and tearing down networks. For example, AT&T's Software-Defined Network service initial setup charge of $105,000 recently was reduced to $65,000.

Unfortunately, the organization's people and politics must also be considered. They can positively and negatively affect decision making. Only astute telecommunications executives can chart the correct course. In doing so, however, they must take risks.

SHARED TENANT SERVICES

JOHN A. CAMPBELL

Out of the ashes

Shared tenant services (STS) in its present form is generally perceived as having failed to deliver on its promises and as offering inappropriate and unattractive services to many tenants, especially the larger ones. What went wrong? Of more interest, perhaps, are the related questions: What does it take to do it right? Is there such a thing as viable STS?

Tenants large and small have real problems and communications needs for which they seek help, but all too often they do not want to buy what the STS service provider has to sell. One of STS' keys to success is that many buildings have a small number of large tenants. But these tenants most likely have their own private branch exchanges and a heightened concern about control and security of corporate data in a shared environment. They often find the STS services offered do not solve their particular problems.

It is a classic case of the planned product not adjusting to rapidly changing market conditions during development. If STS is to be a successful concept, it must change from its old, somewhat discredited approach. STS is dead. Long live STS — in its new maturing form.

The single most important change will be the move from a telephony/PBX perspective to one that more closely matches the real needs and concerns of tenants with respect to the movement of information and communications in the broadest sense. The STS name is an issue in its own right. Apart from the stigma of past difficulties, sharing resources with strangers is a warning flag to many managers who are rightly concerned with issues of security and control.

While an STS PBX can offer some data connectivity services, such as the interconnection of asynchronous terminals and several hosts, these services will not be attractive to most managers. The alternative approaches (using a matrix switch, a local-area network or their own PBX) offer similar functions at similar costs, but avoid the control and security concerns raised by STS.

The successful service providers in the next phase of STS will be those that can best help tenants in addressing their overall information problems. Telephony services are fine, but can you, Mr. Service Provider, help me with my data communications costs, reliability problems and multivendor hassles? Can you help me reduce my personal computer dial-up costs, provide lower cost access to Telenet Communications Corp.'s or Tymnet/McDonnell Douglas Network Systems, Inc.'s services, provide electronic mail gateways and offer videoconferencing?

The new STS will broaden its focus to encompass, in a practical and relevant way, physical level data services and higher level data services, including some in-building support for 3270 and external host access. It will also encompass video services and building control services. It will help with private local-area nets, backbone services, gateways, packet assembler/disassemblers, multiplexers and more. Some creative services involving facsimiles, electronic mail and other applications will appear.

Many of these nonvoice services will, in fact, bypass the STS PBX. The present emphasis on this PBX as an essential participant in any and all STS data services is inappropriate but understandable.

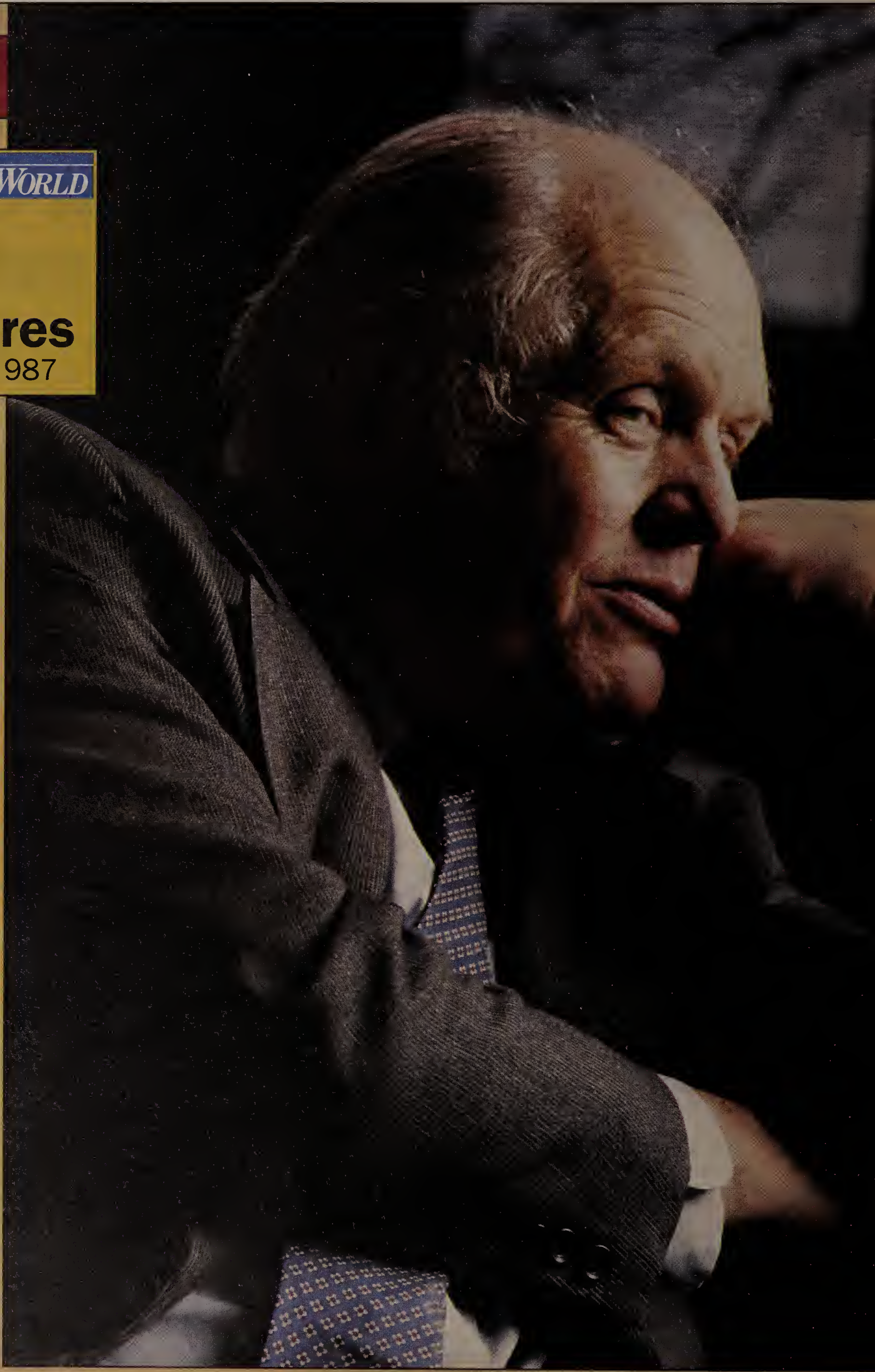
But why must STS offer even more services when it is tough sledding to sell the basic voice services at present? It must be because tenants are looking for a good information department store rather than a phone center. STS can, in many cases, interpose itself between tenants and product and service vendors, to the considerable benefit of the tenants.

It will be no easy task for current STS providers to change their perspective and service offerings. STS is necessarily becoming more complex for the provider in order to offer a selected range of useful benefits to a broader base of tenants, especially larger ones. But there is renewed interest and activity in STS along these lines today, and this year and next will see growing availability and success of such communications support services for tenants.

Campbell is a principal of MultiSystems Interconnect in Stow, Mass., an STS and multivendor networking consulting firm.

Features

April 6, 1987



DEC's Ken Olsen

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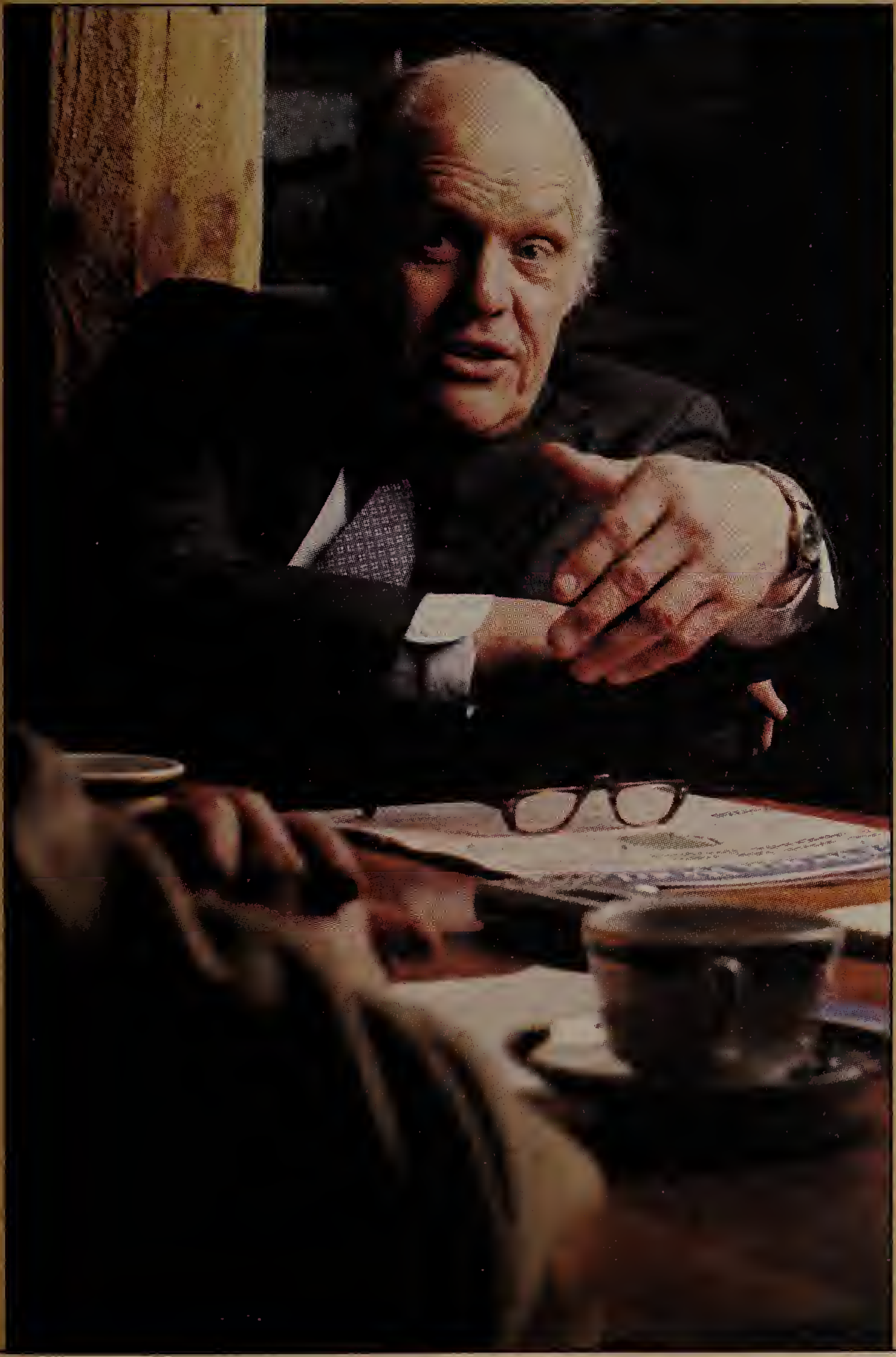

against the proprietary nature of IBM's Systems Network Architecture because it does not adhere to the International Standards Organizations's Open Systems Interconnect model.

But, if you had obtained those supposedly astute opinions from us, you would have received bad information.

DEC's 61-year-old founder and president is into openness, alright, but openness as defined by DEC. That means openness adorned with a lot of DEC-proprietary bells and whistles. That means openness that you have to pay to use.

If you talked to Olsen, he'd tell you what he told us: It costs money to make computers compatible, lots of money.

Specifically, it takes a lot of money to write the software that makes it all happen. Once you've spent hundreds of millions of dollars and thousands of man-hours striving to create the software that creates openness, you're not just going to turn around and give it away on a silver disk drive.

On another subject, Olsen would also tell you we've all been getting carried away with this voice and data integration stuff within buildings and campuses. Hey, the telephone network is great for voice. Why change it? And Ethernet can more than take care of your data traffic. No problem there. So why fix it if it ain't broke? Because some magazine told you to?

Integrated Services Digital Net-

☞ See **Olsen** page 32

Olsen from **page 31**

work? C'mon, he'd say. Now there's a technology in search of an application. Maybe it would have caught on 10 years ago, but who needs it now? Not you.

And so it goes, back and forth. The great thing about interviewing Ken Olsen is, you don't just sit there, ask questions and then get answers. You discuss, you disagree, you get into it. We invite you to do the same.

— Bruce Hoard

Should data processing managers or MIS managers control voice and data communications as well as data processing?

Voice communications has little to do with computer networks. There's no question about the fact that between buildings, between towns and between countries, computers have to have access to all the means of communications, whether it be telephone, satellite, fiber or microwave. But in general, we see little reason for tying telephones and computers together within a campus or building. Sometimes, both jobs are dumped on someone — that's just because no one else wants the telephone job.

Our DECconnect wall jack has connections for Ethernet, video, telephone and low-speed data, and we say it's integrated because it all comes in neatly in one place, but once it gets beyond there, the telephone is separated. As far as telephones are concerned, the technology is slow-moving and the standards tend to be political. It's completely different with computers, so just freeing them up from each other is the obvious way to go.

The next question is, 'What about ISDN?' It means different things to different people, and of course we're all for the efficiencies you can gain in transmission between buildings, but we don't see any reason for ISDN in the office today or on the desk.

If we had ISDN 10 years ago, we probably would have fallen in love with it, but since then networking has developed so much, it means much more than just simple communications. In many parts of your operation, you want to be able to swap data and swap computing. You want much higher speed and much more freedom than when using a telephone line.

So 10 years ago it might have been fine, but today our ideas, desires and needs in networking are way beyond ISDN. The ideas and standards haven't been accepted yet. And after that, all the tedious details necessary to make it useful in an office have to be worked out. Now, we're interested in ISDN in those countries that say by law that this is what you'll have in every office, but I think by the time it's ready, those countries will adapt to it.

In other words, they're not going to hold back their own workers in order to meet some arbitrary standard they selected a long time ago.

Even though you say we don't need ISDN now, won't there eventually be a need for some sort of functional integration of voice and data capabilities?

Why? Because some magazine wrote it? The idea came from some reporter who said, 'Gee, they both use the same technology, they ought to be done by the same company.' So everybody started marrying companies, and the idea sings musically or something, but that's about it. The reliability you want is completely different, the types of people are different, the technologies are very different and there's no relationship between them. Telephones are all political, because the standards take forever to get through and then they last forever. In computers, we change things all the time with no politics at all.

"The next question is, 'What about ISDN?' It means different things to different people . . . but we don't see any reason for ISDN in the office today or on the desk."

The question we didn't answer is, are we going to get married to some telephone company? No, because that is so important we want to have access to all of them.

John Tyson, vice-president of marketing at Northern Telecom, Inc., recently said to us that Northern Telecom keeps going places and DEC keeps popping up. He made it sound like there is almost a marriage of convenience between you now.

No, we were very open from the start. We're very close to most telephone companies; most of them are good customers and we have joint projects with some of them. We very openly say that Ethernet is years ahead in the office and there is no indication that telephone lines will have any contribution to make.

Now, indeed, some agreed and said let's cooperate on those areas we can. Some still have a belief they read of in a magazine — hopefully not yours — that they're going to get married someday. Or maybe it was a financial analyst who wrote a paper and said that. But Ethernet has been going for so many years and does things you never could do with telephone lines.

There's a lot of talk these days about a new job title: chief information officer, or CIO. How many of these people do you personally know of, and what role should they play in corporate network implementation?

I don't know how many of them there are. With that title, I think you obviously get the telephone and the computer networks, any inside mail and a few other things. It's not far enough along to draw conclusions, but the people who seem best at this are usually taken from a line position. They're president of a division or some other corporate unit, so they understand all aspects of the business, and some of them are MIS.

MIS people, you know, are not dumb. It's just that their job is different. Some MIS directors are very competent and immediately become broad when the problem becomes broad. Most companies change their way of organizing very slowly. And right now, most of them are busy either acquiring or being terrified about being acquired.

It's been estimated that only about 10% of Fortune 1,000 companies are using networking as a strategic weapon. Do you think that's a reasonable figure?

Very few are using it at all to a useful degree. That's probably a good measure. We see an awful lot of networking in which people have particular problems to solve, but they don't really have the vision of what networking will do for them overall. That's still to come. It's obvious that [networking is] where they're going to go, but most of them don't have that vision quite yet.

You sound patient when you say that.

Oh yes, it took us 20 years to sell interactive computing.

Now that we have diskless personal computers and multiuser, multitasking personal computer local network servers, what are your thoughts about the perennial argument over the relative merits of minicomputers and local networks?

I don't know about that argument. The conflict between PCs in a network and minicomputers is almost irrelevant. The important argument was that people said that PCs would do everything.

And they also said very clearly, and all the data backed them up, that people want to go off and buy their own PCs and their own software. This is blatant foolishness, because if you're going to work in an organization, you've got to work together. Everybody has to have computers to work together. They have to have the same software everywhere, so that every time a budget comes up, for example, it will be in the same format they were used to last time and not a brand new one.

The idea of a personal computer is just, by title, in contradiction to the needs of an organization, where you want to work together, not as individuals. We're very conscious of that conflict. Some people say, and it might very well be true, that what caused the computer recession was excessive investment in personal computers. It ended up doing almost nothing for organizations because it was a bunch of people wasting their time working off in their own directions and not working together.

The obvious answer was networking them together, sometimes using them only as terminals.

You seem to be arguing for a companywide networking strategy. What are the biggest obstacles you run up against in convincing people to agree with that?

Two things. Everybody wants to build their own network, and every department wants to build their own network and often even design their own network. It's a natural reaction for every part of a company to want to be different from every other part.

When I was out at the Autofact ['87] show, they had a program that showed the organization drawn as concentric circles, and in the center was manufacturing. If the engineers had a convention, they would have drawn concentric circles with engineering in the center, and office people would have had the office in the center, and so forth. It's just the nature of people.

It is not natural for people to ever think that networking should go beyond the boundaries of their department — and that's the broad thinkers. Most of them don't even think beyond the boundaries of their own offices.

So the first thing is to convince people that if you're really going to get a company to work together and exploit networking, you have to use the same networking all over. It sounds obvious, but it's not human nature. And then to top it off, everybody would like to invent their own network. A few years ago, everybody wanted to make their own computer; that's why we have 500 to 700 different personal computers. Everybody had to go out and make their own, each one slightly better than everyone else's, at least for some specialized applications.

And there are probably 500 ways you can make a network. We say we've gone over every one of them, but I'm sure we haven't. Some small companies had six or eight different networks, and they all worked — for very small networks.

DEC's own internal network is renowned as one of the largest and most sophisticated private networks in the world. What lessons have you learned from that? What complaints do you hear from users even now about that network?

We take it so for granted. We grow it so fast that sometimes we expand it beyond its capability just because we take it for granted. We assume it's like electricity or water. If you quadruple the number of people in a place and never tell anybody, then you run out of electricity or water. And we run out of networking sometimes. We can keep up when we know what's going on, but if we take it for granted, it's a big problem.

Electronic mail is something we've done for so long that we never think of that. I'll send half a dozen notes to all the vice-presidents on a Monday morning and just take it for granted that they'll all have it by 9:00. And now computing is being shared on the network, and people take it for granted that when the job gets larger, the network just absorbs more computing automatically.

An interesting thing that's happened is that when we come up with a new computer, people will put it on the network instead of announcing that it works. Then somebody will notice that his job is done quicker or more efficiently, and suddenly the word goes out that the new computer is on the network. It's that kind of floating, free-flowing operation.

Users are becoming more and more skeptical these days of so-called open systems and standards that are nevertheless proprietary, mutually incompatible or not really open. Just how open is DEC, which has just closed its VAX BI bus?

Standards make possible proprietary products. If you're going to develop a transportation system, you first have to set some standards. Is it going to be on rails or on roads? If it's cars in tandem, what type of couplings do you use? Are you going to drive on the right- or left-hand side of the road?

A standard is not a product, but standards make it possible for products to fit together within the limitations of the standards. But standards encourage people to make proprietary products. For example, you can make a whole line of cars and trucks that you'll try very hard to make different from everybody else's. You'll patent features, and everything that's unique you'll exploit, because you want to make your car or truck or train better than anybody else's. So from one point of view, they'll fit on the same roads, the same tracks and the steering wheel will be on the same side of the cars, but you'll make it as unique as you can. So open standards and proprietary products are not incompatible with each other.

Now, here's the shocking thing. It is unbelievable, but in the world today there are some people who think that when [Open Systems Interconnect (OSI)] is settled, they won't have to do any developmental work and the whole thing will be given to them to manufacture. That's like saying that just because we're going to drive cars on the right-hand side of the road, that gives you a proprietary automobile to sell. So there are a lot of companies doing no investment in networking, and that doesn't make any sense at all.

You can connect things to Ethernet, but it takes a massive piece of software, usually in an operating system, to make it all work. And OSI is not an operating system, it's a set of standards. Standards are very important, but with proprietary products people have to make investments, and in our case it's been many hundreds of millions of dollars, maybe billions, to make our Ethernet proprietary products. Now we defend the proprietary nature of these, because that's our investment and the reason we did this is so we'd have a proprietary position. And yet at the same time we support standards as much as possible.

> "A standard is not a product. . .but standards encourage people to make proprietary products."

Based on that, it seems you couldn't argue with IBM's not working to make Systems Network Architecture compatible with OSI.

There's no such thing as compatibility there. One is a train and one is a car. They're absolutely different. It appears that IBM loses its monopoly if SNA ever disappears. OSI is a conflict: If people want OSI, they don't want SNA and IBM loses. The other side of that is that many organizations like SNA because it's built like an organization is built.

Masters and slaves?

Yes. If the telephone was invented today and you came to an organization to sell a telephone, they'd set up a committee deciding who could speak to whom. And you'd have a hierarchy just like the organization chart. If somebody moved or got promoted, you'd have to cut down the whole system and rewire it and reprogram it. And that's like SNA. It has great appeal to the hierarchy and apparent security. Fortunately, the telephone system sneaked up on business and it was an open system. Everybody could plug in everywhere, and you could install a new telephone almost by just plugging it into your wall. And that's what OSI and DECnet are.

Somebody was quoted recently as saying that if they made the telephone system like SNA, and you installed a new handset in Munich, the whole world would shut down while they reprogrammed the system. Now that might be an exaggeration, but a whole company would shut down anyway, while they installed the new handset.

So SNA is the elitist form of networking?

Well, we have worse words than that. But it has great appeal where you want to hold all the information at the top, and the boss has great satisfaction in thinking that he controls every message.

Our point of view is that we hate to see any compromise in the OSI structure. We're afraid of creeping SNA. People can have that centralized way if they want it, but it's not for the world that wants to exploit the whole organization and give people the opportunity to communicate freely.

With your view of OSI, are we going to have multiple incompatible implementations of OSI? Will users always need a lot of gateways and other inconvenient ways of providing multivendor connectivity?

If you have a network, you're not going to have several operating systems there, you're going to pick one operating system. What's going to run OSI? It's not something that anybody plugs into. It takes an operating system to run it. With us, our VMS runs the network. Now you can communicate, but the features that make the whole thing so beautiful are in the operating system. You have to have some system there that controls it all. Now that software is written by somebody, and all the features that make it interesting, exciting and useful are incompatible with somebody else's features. That doesn't get taken care of by just the standards in OSI.

But DEC supports Unix and MS-DOS, and it can be argued that you should support still other operating systems to help users get multivendor connectivity.

It's a chore just having to support those two extra operating systems. We'd love to support Apple [Computer, Inc.], but we're not sure we can really do a good job supporting one more. They'd like us to, and we'd like to, but it's too much to support another one. The operating system to do all this is very complex, and one thing's for sure: Those people who are making no investment in it aren't going to be able to do it.

If you were John Akers, chairman of the board at IBM, how would you compete against DEC in terms of communications strategy?

I won't say it was my idea, because it probably wasn't, but it's been suggested that IBM is espousing SNA more and more vocally and with more and more enthusiasm. So much so, that it would not be surprising if maybe they're going wholeheartedly after Ethernet and OSI and planning to get everything open just the way we're doing it. And at the same time, in order to keep their world together, they're espousing SNA more vocally than ever. So I wouldn't be surprised if suddenly they say, 'Gee, no more SNA.'

How much business could DEC take away from IBM once DEC fully realizes its communications strategies and goals?

Much of that line of thinking does come from the press, because in the areas IBM has worked hard in — the very large centralized computers — they've maintained a huge market share. That market happens to be down now, and we didn't take it away from them. The economy just hurt the thing that they do well. That's not our fault.

People tend to want to pit IBM and DEC against each other.

Yes, and we wish they'd get off it, because when the press says DEC is doing well and IBM isn't, then IBM suddenly says we'd better get into the area that Digital is in. So if you guys didn't stir up the trouble, they'd stay away from us, and we've got to stay away from them because they've got this big investment in it.

What barriers do you see to the widespread implementation of the Manufacturing Automation Protocol?

Who's going to develop it? The software to run a network is massive, from our point of view. Our experience says it's hundreds of millions of dollars and years and years of testing and thinking out every possible configuration, and then every component has to be tested. And our experience says that you have to protect the network from every component and every software failure. It's amazing work, and it takes massive support. We've probably put between 100 million and 200 million dollars into just supporting [MAP], and that's just our proprietary part of an industry standard.

You don't just say, 'We'll have a committee part-time.' This means emotional, deep, full-time commitment by very competent experts who are going to stick with it for years. Then there's documentation and all of the infrastructure necessary for supporting it.

People are saying, 'We don't want to go with Digital, because that's proprietary.' But somebody's got to make proprietary software to make either [Technical and Office Protocol] or MAP work. A committee isn't going to do it, that's for sure. It's very expensive and needs enormous support, and from our experience you can conclude that no way is someone going to write a system that works with everybody's products and everybody's computers.

But X.25 is an accepted standard that everyone implements in basically the same way.

No, I don't think that's true. What I've heard some people say is, 'No, we don't ever want to do that again, because everybody went off and did it differently.' And that's just a trivially simple point-to-point packet-switching system. Networks are probably one of the most complicated pieces of technology in our world today, and yet a small network is so simple that you could go down to your local computer store and buy a bunch of Ethernet pieces and tie a

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couple dozen PCs together, and we could just do it right here in a couple of hours.

But when you want to do something useful in the larger organization or in the factory, networking is one of the most complicated technologies in the world. Yet because the basic concepts are so simple, everybody wants to invent their own.

We're able to make our system work, after an enormous investment, probably one or two billion dollars, by having only one protocol, one architecture, one software system and one networking system.

It's ridiculous to think that with nobody investing in it, software is going to come miraculously from heaven that makes anything anybody ever wants to plug into it work.

Our attitude is very straightforward. If our friends want help, we support them, we help them. But by support we don't mean we know who's going to do the software for MAP. We don't see any indication that anybody even knows what the software problem is at all. And who's going to test all of these pieces of equipment to make sure that they work?

Perhaps the Corporation for Open Systems (COS). What role should COS should play in the industry?

They should make sure that the standards are accepted and are clear and simple. For example, red means stop and green means go and we drive on the right-hand side of the road. But that doesn't mean that people can suddenly be in the truck business without ever making any investments in the truck business. And if your truck needs ongoing support and maintenance, spare parts and supplies, COS won't take care of that for you.

You argue for Ethernet in the factory. Won't users need more than 10M bits of throughput in factories that depend on real-time control systems?

DECnet is real-time; we've made huge networks and never run into a timing problem. And what moves so fast in a factory that if you had a restart a few microseconds later you'd ever know the difference? Nothing moves fast in the factory. Most things are tediously slow.

From what I hear, MAP didn't work the way they wanted it to anyway. They had to have subnets. Subnets just come naturally with Ethernet; they're part of it. If we had a work group here, we'd be isolated from the rest, so that within our group, information that's addressed locally never gets on the main network. So they had to break up the factory that way anyway.

At the recent Communication Networks '87 show in Washington, D.C., network management was one of the hottest topics. What demand do you see among your users for increased or more sophisticated network management?

When I talk about this enormous amount of software to make it work, that's largely network management software. We'll do more and more, and we're adding more intelligence to the components that we put in the network to make it more sophisticated.

Are there any major flaws in DEC's networking strategy at this point? How about fault tolerance?

I'd better answer that one with a little bit of history. We were working hard on fault tolerance in the 1970s. We built our 1172, which maybe by mistake we never sold. It was a traditional fault-tolerant machine based on the PDP-11, and it worked very well. We used a few of them here, but we never sold them. And we went on to solve a general problem, which ended up being our cluster.

So our clustering was set up to add a general solution so you could combine the computers to solve any problem you wanted.

You could do parallel computing for redundancy or for speed, or just to add more users. Most people don't want to be redundant on everything.

What will be the impact of parallel processing on networking and computing over the next 10 years?

We don't know. We were doing an awful lot of work on parallel processing. The dream was so beautiful: Take $10 chips, put a lot of them together and you've got a very powerful computer for not very much money. But the dream got complicated. In order to make the software even tolerable, you had to add a lot of cost to it, and then it wasn't really easy. And then somehow you had to tell whether any of the computers were broken, and that added complexity to the dream.

So the wonderful naive passion is gone, and we're still doing developmental work — not a product anymore. We're watching it and we haven't given up totally, but the enthusiasm coming out of naivete is gone. ☐

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Try this network quiz.

1. Does your present network allow interconnection of all your data devices? Yes ☐ No ☐

2. Is performance—throughput and resource usage—at optimum levels? Yes ☐ No ☐

3. Is your user interface simple enough and management info complete enough that the "HELP" phone is rarely needed? Yes ☐ No ☐

4. Can you add devices without a network SYSGEN? Yes ☐ No ☐

5. Is your current network architecture an "open" one that prepares you for the current move toward standardization? Yes ☐ No ☐

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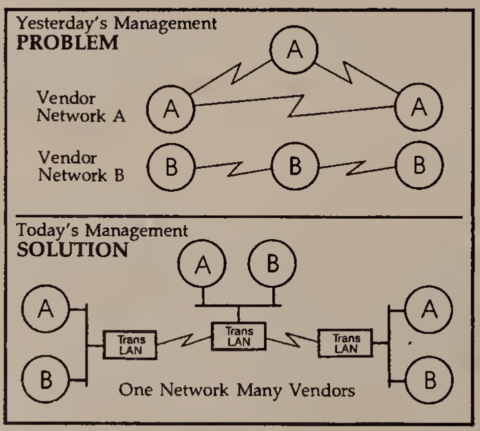

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What does DEC have now

New products are integrating diverse DEC systems

BY RAY KAPLAN
AND DAVID PALMER
Special to Network World

It's a system manager's dream to have a completely homogeneous network in which each processor runs the same operating system and applications. But with the advent of the supermicro, many users have different machines running different operating systems and applications, and each user has become his own system manager.

Professional system managers need tools that support centralized network management without robbing users of their independence. Digital Equipment Corp.'s recent flurry of hardware and software announcements addresses those needs and puts teeth into the advertising slogan that says, for integrated networking, "Digital has it

See **DEC** page 36

Kaplan is a consultant with Pivotal, Inc., a Tucson, Ariz.-based computer consulting firm specializing in VAX/VMS applications. Palmer is a Tucson-based freelance writer.

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now." Several new networking products are filling out the DECnet architecture and providing system managers with more connectivity and control over increasingly distributed networks.

One of DEC's main strengths is its product integration through DECnet. Nearly everything the company makes can communicate over its network, and DEC is providing easy connectivity to non-DEC systems.

For example, the DECnet-DOS system allows DECnet interconnection with IBM Personal Computers, XTs and ATs through either asynchronous connections or direct connections to Ethernet. This implementation of DECnet causes an MS-DOS or PC-DOS system to function as a network node.

Another example of DEC's efforts to interconnect non-DEC machines, announced last year along with the VAXmate personal computer, is VAX/VMS services for MS-DOS. This facility provides users of MS-DOS-based personal computers with access to VAX/VMS files, print services and network management and control services. VAX/VMS services are made available to personal computer users via Microsoft Corp.'s MS-NET network, which uses the data-link layer protocols of Digital Network Architecture.

While the personal computer software and hardware announcements round out DEC's Personal Computing Architecture, the new MicroVAX 2000 puts the power of a supermicro into a desktop workstation.

With up to 6M bytes of memory, the MicroVAX 2000 can support up to four users, and more users can access the machine through its built-in Ethernet link. DEC has also introduced a print server that can serve an entire network. The Print Server 40 uses Adobe System, Inc.'s Postscript page-preparation language and a 40-page-per-minute MicroVAX-based laser print engine.

Remote systems management

These new machines go a long way toward filling out DEC's workstation offerings, but they could also make network managers' lives a nightmare because of the ease with which users can connect them to existing DEC networks. DEC's response to this problem is the introduction of its Remote System Manager (RSM).

With up to 6M bytes of memory, the MicroVAX 2000 can support up to four users, and more users can access the machine through its built-in Ethernet link. DEC has also introduced a print server that can serve an entire network.

DEC announced the RSM system, which allows centralized management of dissimilar VAX network nodes, in preparation for the introduction of its new, smaller VAX workstations. RSM provides a toolbox for management of a collection of VAX/VMS computer systems, including single-user or multiuser MicroVAXes or VAXstations, on Ethernet. This may include bridges to other Ethernet segments.

RSM also lays a firm foundation for extending such control to other DEC network segments, including non-VAX machines running operating systems other than VMS. For example, systems running Ultrix (DEC's version of Unix) have been interconnected through DECnet Ultrix. The next step will be the development of enhanced services for Ultrix and other DEC environments that are functionally similar to VAX/VMS services for MS-DOS.

In the future, interconnection may extend beyond DEC systems to include, for example, a DECnet-Hewlett-Packard Co. connection for HP systems. So far, however, DEC has shown no interest in offering such support for other vendors' systems.

Increased efficiencies in system utilization, enhanced system and file security, and standardized backup and recovery routines seem guaranteed to make RSM a winner.

However, the organizational structures RSM is designed to integrate may resist centralization. Even though RSM offers users full functionality while relieving them of the drudgery of system management, smaller users may view the system manager's assumption of these tasks as an affront. User acceptance of centralized management tools will be a critical element in determining RSM's success.

VAXcluster evolution

Several years ago, DEC announced the VAXcluster, a high-speed processor-to-processor bus that interconnects many VAX computers and mass storage units. Based on DEC's Systems Communications Architecture, the internal architecture of the VAX/VMS operating system that supports clusters, the VAXcluster supports a fully distributed file system.

The original VAXcluster implementation enabled VAX processors, including the 11/750, 11/780, 11/782, 11/785 and 8000 series, to be connected with DEC's Hierarchical Storage Controller disk controller. This provided a degree of fault tolerance and access to many gigabytes of shared data and system files.

In fact, the architecture of the VAXcluster allowed every VAX processor in the VAXcluster to boot and run from the same operating system copy, which is in a central storage area. This was a boon for VAXcluster management in the face of the increasing complexity of the VAXes and their applications.

In a VAXcluster, combined processing power can be made available to users as a service on their networks. For instance, when users connecting to the local-area network ask for the office automation service, they would be connected to a VAXcluster that supports office automation. Through DEC's terminal servers, users could be transparently connected to any available processor on the office automation VAXcluster.

A heterogeneous cluster runs different versions of the VMS operating system and application software on each node. Each node is managed separately and merely shares access to centrally located data. Distributed systems may also be heterogeneous, since they often contain a mixture of different system software and hardware.

Increased efficiencies in system utilization, enhanced system and file security, and standardized backup and recovery routines seem guaranteed to make RSM a winner.

They also comprise different application environments and may have different usage patterns for the same applications software.

Since its fully distributed file system works so well, the VAXcluster has taken the world by storm. With VMS Version 4.6, through synchronization provided by Distributed Lock Manager VAXcluster system software, each of 100 jobs on 27 VAX processors can write to the same record in the same file simultaneously, without interfering with one another.

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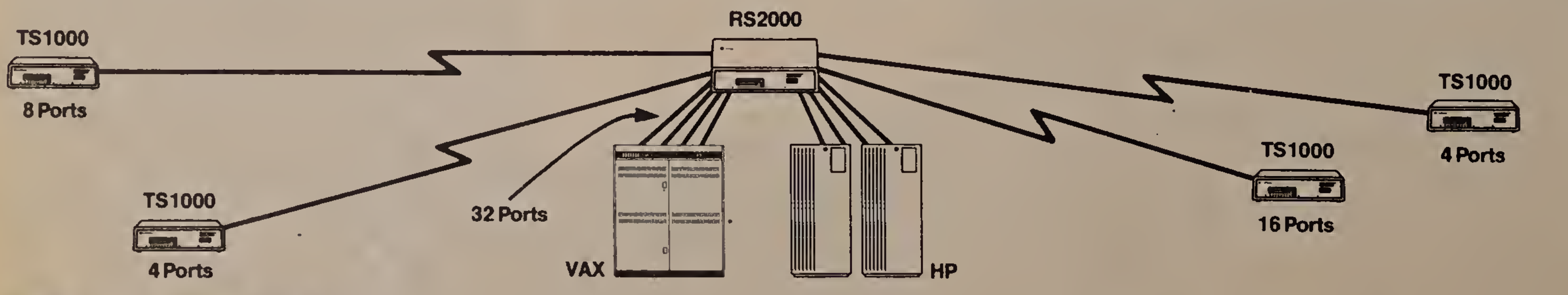

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VAXclusters and RSM

With the advent of RSM, the next evolutionary step has been to extend the VAXcluster concept to the network. VAXclusters were originally distance-limited because the 10M bit/sec coaxial cable connections between cluster components had a maximum radius of 45 meters. DEC's recently introduced Local Area VAXcluster extends its connections to include operation over Ethernet. In doing so, DEC has made it possible for tabletop VAX workstations to be configured in a wide variety of ways.

For instance, a VAX2000 workstation can be run in a diskless manner in which the operating system is downloaded from the network, and application software and data are available over the network.

Since the swapping and paging activity inherent in the operation of a VAX/VMS system can be expensive when done over the network, a workstation might be configured with a local disk that could be used strictly for swapping and paging.

In another configuration, the operating system and the application software could reside on a workstation's local disk, and the Local Area VAXcluster would merely provide an access path to centrally stored data.

Local Area VAXclusters that are managed in a homogeneous manner are especially well-suited to work groups, where ease of access to central data and ease of system management are important.

> With the array of mature network products that DEC provides today, it's not hard to imagine that users might soon see single-point management of distributed systems for up to several hundred homogeneous, geographically dispersed nodes.

In recent VAX/VMS product releases, users have seen the emergence of so-called "remote" or "distributed" applications. As a logical extension of the task-to-task interprocess communications mechanisms that have existed within the DECnet architecture since its introduction, much DEC software is now based on the concept of having servers that can reside on different network nodes. These nodes only serve requests from the network for access to their resources. In this context, the server is a multithreaded, multitasking program that can service many simultaneous network access requests to one or many resources on that node.

Examples of such products include VAX Notes, the recently announced VAX/VMS multiuser teleconferencing system; the VAX VTX videotex system; and Datatreive, a data query language and report writer. Given the flexibility of DECnet, one can speculate that this remote server scheme might be the future direction that DEC's network applications will take.

The future

With the array of mature network products that DEC provides today, it's not hard to imagine that users might soon see single-point management of distributed systems for up to several hundred homogeneous, geographically dispersed nodes.

This might include such capabilities as downloading and management of operating systems, installation verification, performance testing, network bridge management, fault management, loop-back and remote diagnostics, error logging, accounting, security through encryption and key distribution, and a test/certification/release cycle for application software.

While this seems attractive for organizations that have to manage collections of MS-DOS, CP/M, Unix, and VAX/VMS systems, the possibility of being able to say "please print this on the printer that's physically nearest to me on the network" is even more enticing. Given the advances of DEC's networking technology, such network devices as generic file servers and generic disk space servers could be on the way.

DEC is maintaining its lead in networking by continuing to introduce integrated tools for distributed system management. DEC's networking strategy provides users with an architecture that will continue to offer increased connectivity. As a result, if users require network solutions that DEC doesn't have now, it's likely that they can be added in the future. ◻

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Special Section: DEC

The engineering angle

Here's a perspective on networking trends from DEC Distributed Systems V.P. Bill Johnson.

PHOTO © 1987 JOHN OWENS

Bill Johnson is vice-president of distributed systems at Digital Equipment Corp. He is responsible for the engineering and marketing of communications and networking products, as well as for international engineering and the engineering of imaging products and artificial intelligence systems.

Johnson joined DEC in 1973 as a consulting engineer and was instrumental in establishing the Manufacturing Test Diagnostic Organization, which was responsible for automation of manufacturing.

While technical director for the Office of Development, Johnson was responsible for diagnostic engineering, systems architecture and technology. He was named vice-president in 1982 and was responsible for VAX systems and

☞ See **Johnson** page 41

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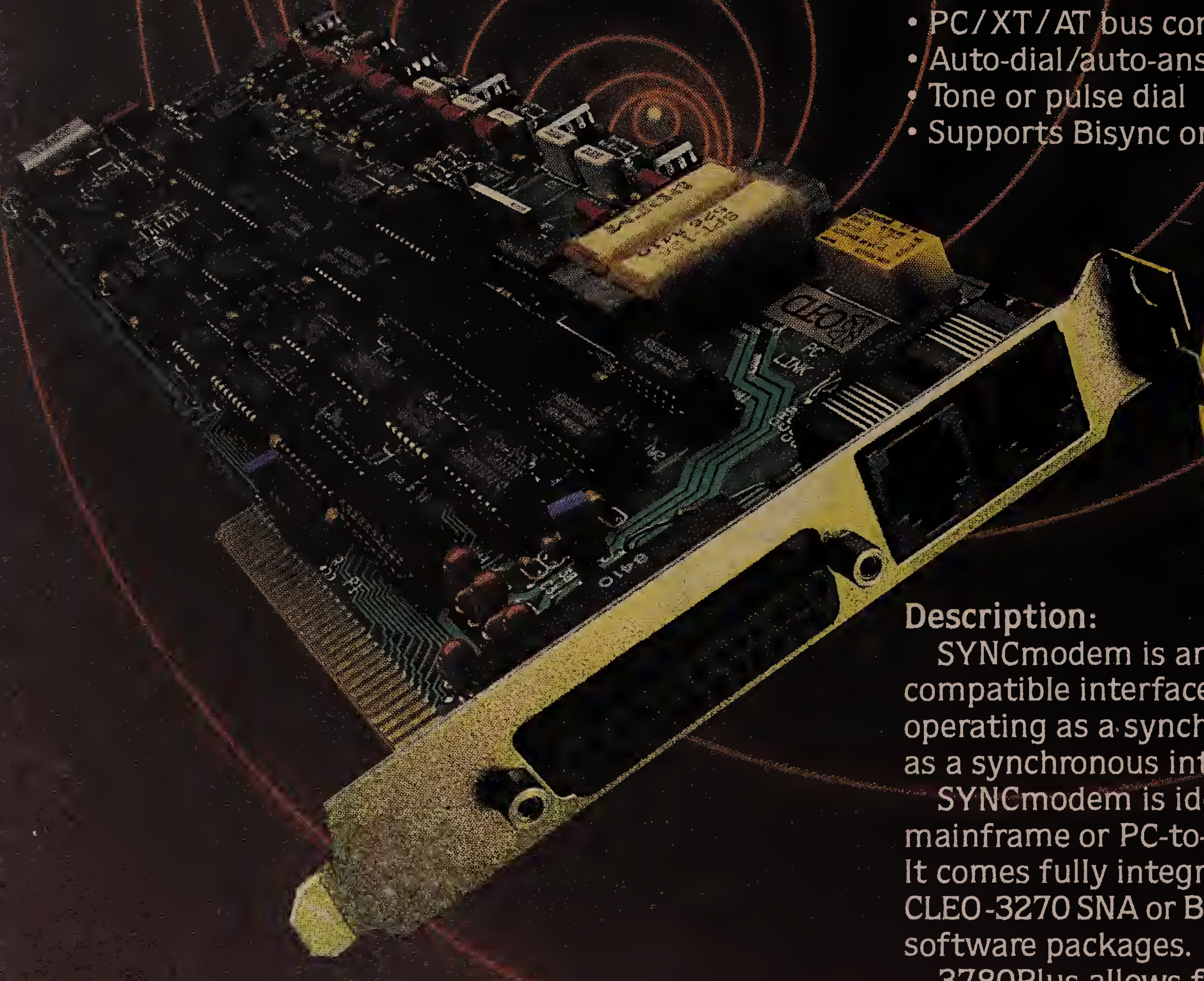

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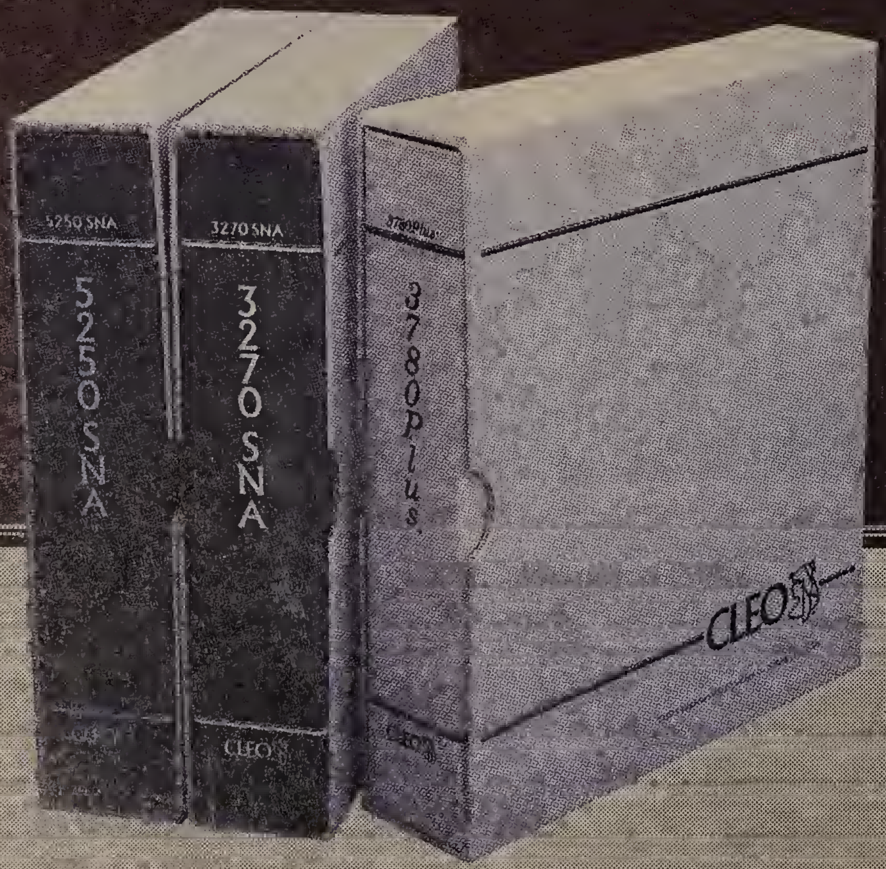

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1

My primary areas of activity: (Circle ONE only)

I am involved in evaluating communications (data, voice and/or image) products and services:

1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both
4. Other (explain) ____________________

1a

For communications, my primary responsibility is: (Circle ONE only)

1. Data Communications
2. Voice Communications
3. Both
4. Other (explain) ____________________

2

Circle only the ONE title classification which most applies to you.

Company Management

11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CEO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management

Data Communications

21. Management
    VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff:
    Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services

Telecommunications

31. Management
    VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff: Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services

Factory Communications

41. Management
42. Supervisory/Staff

MIS/Data Processing

51. Management
    VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of Systems Design, Analysis Applications

Others

75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other ____________________

3

Job Function

Which one of the following best describes your functional involvement with communications (data, voice, and /or video) products? (Circle ONE only)

Corporate

1. Business Management, Planning and/or Development

Communications System/Network

2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other ____________________

4

Which one of the following best describes the primary business activity of your organization at this location? (Circle ONE only)

Consultants

11. DP/Communications Consulting Services
12. Consulting Services (except DP/ Communications)

End Users

13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/ Construction/ Petroleum Refining/ Agriculture/ Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors

41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, International Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other ____________________

5

In which ways do you typically become involved in acquiring communication products (data, voice, and/or video) and services? (Circle ALL that apply)

1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6

Check ALL that apply in columns A and B.

A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:

B. These products and services are presently in use at this location:

	A	B	Product/Services
			Computers
01.	☐	☐	Micros
02.	☐	☐	Minis
03.	☐	☐	Mainframes
34.	☐	☐	Printers
			Data Communications
04.	☐	☐	Communications Processors
05.	☐	☐	Comm./Networks Software
06.	☐	☐	Digital Switching Equipment
07.	☐	☐	Facsimile
08.	☐	☐	Modems
09.	☐	☐	Multiplexers
10.	☐	☐	Protocol Converters
11.	☐	☐	Network Mgmt. & Control
12.	☐	☐	Test Equipment
13.	☐	☐	3270 Controllers
35.	☐	☐	Intelligent Terminals
			Telecommunications
14.	☐	☐	PBXs
15.	☐	☐	Key Systems
16.	☐	☐	Central Office Equipment
17.	☐	☐	Integrated Voice/Data Terminals

	A	B	Product/Services
			Transmission/Network Services Equipment
18.	☐	☐	Microwave
19.	☐	☐	Satellite Earth Stations
20.	☐	☐	Local Area Networks
21.	☐	☐	Wide Area Networks
22.	☐	☐	Packet Switching Equipment
23.	☐	☐	Fiber Optic Equipment
36.	☐	☐	T1
			Communications Services
24.	☐	☐	Packet Switching Services
25.	☐	☐	Cellular Mobile Radio Services
26.	☐	☐	Electronic Mail
27.	☐	☐	Enhanced Services
28.	☐	☐	Centrex
29.	☐	☐	Long Haul Services
30.	☐	☐	BOC Services
31.	☐	☐	Independent Telco Services
			Other
32.	☐	☐	Factory Communications
33.	☐	☐	Online Data Bases

7

Estimated value of communications systems, equipment and services:

A. which you helped specify, recommend or approve in *last* 12 months? (Check only ONE in column A.)

B. which you plan to specify,recommend or approve in *next* 12 months? (Check only ONE in column B.)

	A	B			A	B	
1.	☐	☐	$10 million and over	6.	☐	☐	$100,000 - $249,999
2.	☐	☐	$5 million - $9.9 million	7.	☐	☐	$50,000 - $99,999
3.	☐	☐	$1 million - $4.9 million	8.	☐	☐	Under $50,000
4.	☐	☐	$500,000 - $999,999	9.	☐	☐	Don't Know
5.	☐	☐	$250,000 - $499,999				

8

Estimated gross annual revenues for your entire company/institution:

(Circle ONE only)

1. Over $1 billion
2. $500 million to $1 billion
3. $100 million to $499.9 million
4. $50 million to $99.9 million
5. $10 million to $49.9 million
6. $5 million to $9.9 million
7. under $5 million

9

Estimated number of total employees at this location:

(Circle ONE only)

1. Over 5,000
2. 1,000 - 4,999
3. 500 - 999
4. 250 - 499
5. 100 - 249
6. 50 - 99
7. 20 - 49
8. 1 - 19

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Johnson from **page 39**

clusters at that time.

Johnson recently shared his views on today's technology trends with Network World *Features Editor Steve Moore.*

Do you agree with Ken Olsen's new emphasis on networking as the central information technology?

Since I was the person who tried to convince him of that, yes. When you step back and look at software and computing systems in the past, they all revolved around communications.

Then, the communications were inherent in the CPU and in the operating system, and occurred between the processor and the I/O, and between software modules.

Now, as intelligence has been put on the desk or somewhere remote from where data traditionally has been stored, what was internal to a large CPU as hidden communications has become very visible. So communications software has come out of the box and is now connecting boxes together, even though in the past, we would have thought of the boxes as being one and the same.

How do you define communications software?

It's software that allows intelligent devices to be able to work together. That definition conveys a broad sense of interrelationship and passing of information parameters or control. It includes software used in communicating between two software modules in the same CPU.

> "It doesn't seem to me that it is right to say data management or information management will become a piece of communications software in the future."

Does that definition include everything from a communications architecture like Open Systems Interconnect (OSI) to a personal computer dial-up communications software program?

Yes, I would say it includes all that.

At what point does a distributed data base management system become a piece of communications software?

Way back, when we just had a base operating system and a simple application like accounts payable running on it, we didn't ask, 'When will accounts payable be an operating system?'

Now, just because we have the data stored somewhere else and we have the control routine that is running accounts payable in another box with communications in between, it doesn't seem to me that it is right to say data management or information management will become a piece of communications software in the future.

> "Now, as intelligence has been put on the desk or somewhere remote from where data traditionally has been stored, what was internal to a large CPU as hidden communications has become very visible."

What we are now talking about is a distributed application, with the data in one place and the control in another place. We are using the communications mechanism as a way of executing the actual program.

How will the trend toward distributed applications affect demand for bandwidth in networks?

Suppose you want to query a data base and pull out only those records or fields that are applicable. You want to be able to pull out only those specific fields that you need and have those transmitted over the network.

Therefore, since you are not transferring the whole file or the

See **Johnson** page 42

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Johnson from **page 41**

whole package, what you are doing is drastically reducing the need for bandwidth on the network. I believe there is a clear opportunity for a data base management system that is truly distributed.

What approach to networking is best for supporting dynamic allocation of bandwidth and other network resources?

When you step back and look at the various networking scenarios that exist, it fundamentally comes down to two types.

One is connection-oriented, like a phone call over a dedicated circuit. The other is the connectionless or adaptive-routing approach, in which data starts being sent at the same time that I make a request for a connection. If the data comes to someplace where there is a bottleneck, the network will use adaptive routing to find another route to that place. You can support dynamic use or allocation of the network topology with either approach.

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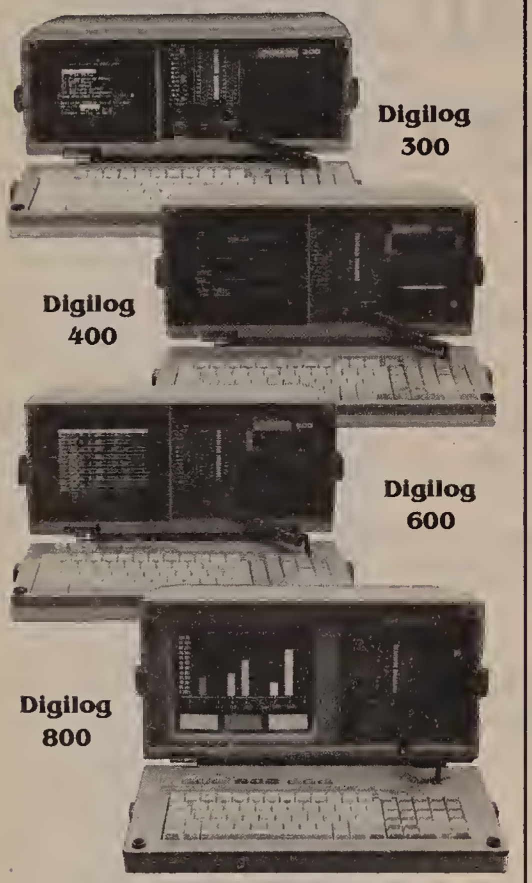

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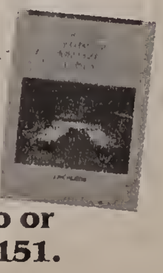

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One of the things the Corporation for Open Systems did that has really been a breakthrough was they came up with a way of providing for communications between connectionless and connection-oriented protocols. Now the technical community is realizing that the religious wars around the two approaches are going to cease.

> "There is a clear opportunity for a data base management system that is truly distributed."

Suppose you wanted to communicate between an IBM Systems Network Architecture network and a Digital Network Architecture network. DEC's approach is clearly connectionless-oriented, and the SNA approach is clearly connection-oriented.

If we are going to use both types of protocols as we move toward OSI, one of the major things that customers will expect is that their networks will play together independent of the vendor and independent of whether it is connection-oriented or connectionless-oriented. At some level of the protocol stack, there has to be a conversion between connection orientation and connectionless orientation.

What will it take to provide users with fully distributed computing so that their tasks may be completed piecemeal by any combination of available local or remote CPUs?

At one level, I would say we can do that today with DECnet. What that means, though, is the people who are writing the application code must take into account that it can be separated, so that a piece of the application could be executed somewhere other than on one common CPU. By and large, it hasn't been done up until now. People are starting to think of that.

Suppose you have a DEC Ethernet-based network and you have terminals tied into a terminal server. You can come up on your terminal and find yourself routed to a CPU based on the number of users on one CPU vs. another. Now one might argue, 'Well, not all those users are doing the same level of job.' That's true. But nevertheless, the initial stages of that dynamic allocation are already occurring.

What can communications managers do to prepare for future distributed computing and networking capabilities?

They need to think about how they are going to be able to expand their networks. If somebody wants to put a new computer on your network, are they able to do it in an hour or does it take weeks? Can you keep the network up while you are bringing on the new system or do you have to take it down? Can your network actually learn that a new computer is on it or do you have to change all the other computers on the network so that they know it's there? Those are the fundamental questions people need to think about.

Another key question the communications manager is running into is, 'How can I manage all the devices that are becoming available to me so that they will interrelate with one another in a meaningful way in the future?'

That is the fundamental reason why the [International Standards Organization] and the OSI model exist. The only way you manage complexity is by moving to some simplifying assumptions. That is what a standard network architecture does for you.

> "One of the things the COS did that has really been a breakthrough was they came up with a way of providing for communications between connectionless and connection-oriented protocols."

Personal computers are gaining multitasking capabilities now. Will they also support multiple users? And if so, what effect will that have on networking?

It's not clear to me that PCs will become multiuser. The cost of a PC workstation is not a significant enough percentage of the salary you are paying someone for you to want him to share it with someone else by having another terminal tied into it using the same processor. There would be no reason to go to an 80386-based PC or a MicroVAX if the person didn't need that kind of performance. You might as well stay with the traditional stuff. As future versions of MicroVAX chips and Intel [Corp.] chips and Motorola chips come out, people will have higher performance alternatives. But the economics don't seem to be there for multiuser PCs.

> "The only way you manage complexity is by moving to some simplifying assumptions. That is what a standard network architecture does for you."

A major issue that ought to be addressed is something I refer to as cooperative computing. That is epitomized by a product we recently introduced, our mail and office system called All-In-1. There are certain functions where you need a high level of cooperation between what someone is doing on the PC and what the mail agent and the office agent are doing on network servers.

So what we have tried to do is optimize the interaction between the user and that central server. There is going to be more of that coming in the future, as we start looking at the application level and finding new ways to use the communications capability that presently exists in local-area networks and wide-area networks.

Apollo Computer, Inc.'s approach is to use a distributed operating system, so that the information passing over the network is more like operating system level commands. Where does that sort of communication occur in terms of the OSI model?

They have taken the communications that are internal to an operating sytem and distributed them. [In terms of OSI,] it is going to be at another level down below, a level zero or level one. They split out the operating system into various pieces that are able to use a wire to communicate with each other.

How would you contrast that approach with what DEC is doing?

The things that are fundamentally the same are the sharing of the external resources to the computing capability. The question is, does one gain a lot by essentially having a distributed operating system vs. an approach where multiple homogeneous operating systems can communicate well together across a high-speed link? I would conjecture that they would have more traffic and therefore less available bandwidth on that link, given the same performance, than we would have. ◻

IBM from **page 1**

All models will run an enhanced version of the current Personal Computer DOS Operating system, Version 3.3. And the 80286- and 80386-based models will run IBM's new multitasking Operating System/2 (OS/2), developed in conjunction with Microsoft, Inc.

In tandem with the IBM announcement, Microsoft unveiled a networking system for OS/2. The Microsoft LAN Manager, which provides file and print sharing, security features and network management tools, will allow MS-DOS, Xenix and OS/2-based microcomputers to be connected on the same network. The LAN Manager will be available in the fourth quarter of this year.

The OS/2 operating system, which will be available in two versions, allows users to simultaneously run multiple applications and large applications that they would not be able to run in a PC DOS environment, according to Lee Reiswig, system manager for communications and data management systems at IBM.

The new operating system will also support a DOS compatibility mode, enabling applications written to PC DOS to run unchanged in real mode under OS/2 services.

A standard version of OS/2, which will include windowing and a graphics-based program interface, will be available in the first quarter of 1988. True communications support, a feature of an extended version of OS/2, will not be available until some time after the standard version is released. The single-tasking DOS 3.3 will serve as an interim operating system.

The extended version of OS/2 will make Personal System/2 processors true peers in a variety of communications environments.

The extended version of the operating system will draw the Personal System/2 under the recently announced Systems Applications Architecture. "OS/2 is the first IBM product announcement that implements a set of standards that are part of SAA," Reiswig said.

SAA components that will be incorporated in OS/2 include the user interface and the graphics program interface; support for C, COBOL and FORTRAN languages; an interface to IBM's SQL relational data manager; and support for network management services and communications protocols, including an LU 6.2 interface, Low Entry Networking, Synchronous Data Link Control and Token-Ring protocols.

IBM extended Token-Ring and Personal Computer Network support to the Personal System/2 family with new network adapters that will be available this month. At $795, the Token-Ring board costs $100 less than the current Personal Computer Adapter II.

IBM will also offer a Token-Ring starter kit designed to operate with the Personal System/2 family and DOS 3.3. It will include an access unit and four adapters, cabling, software and documentation for a pilot network. It is priced at $4,710.

In addition, IBM extended host connectivity to the Personal System/2 with the 3270 Connection adapter and software, which provides 3270 emulation and file transfer capabilities through a link to IBM 3274 and 3174 cluster controllers. The 3270 Workstation Program simultaneously supports up to four host sessions, six PC DOS sessions and two notepad functions.

A baseband version of the broadband Personal Computer Network was also introduced. The new network operates with existing IBM Personal Computers and Personal System/2 machines. The baseband version employs a contention access scheme and operates at 2M bit/sec over all cabling types available in the Cabling System, including telephone-type twisted-pair wire.

Network nodes can be daisy-chained or linked in a star configuration through a network extender. The extender can connect up to 10 daisy chains of eight Personal Computers, allowing the network to span up to 800 ft.

The network was designed to be a low-cost option primarily for educational markets. Adapters are priced at $470 and will be available this month.

Addressing criticisms of existing network offerings, especially in the area of network management, IBM announced the ability to run a single network manager on multiple Token-Rings interconnected with bridges.

According to Robert Steen, the systems manager for local-area networks, who is largely responsible for development of IBM's Token-Ring net, this capability, provided in the Token-Ring Network Bridge Program Version 1.1, allows a network manager to collect information concerning the performance through the bridge. "You can test stations and test connections from end to end through bridges," he said.

IBM also released the LAN Manager Version 1.0 — different from the Microsoft program of the same name — which aids network managers in problem determination and error recovery. It can run as an application of NetView/PC, forwarding alerts to a host-resident NetView for remote operation.

Operating in tandem with a host-based NetView is the 3270 Emulation LAN Management Program. This program allows a small, remote local network to be managed from a central site.

IBM enhanced the network management capabilities and performance of the PC LAN Program in Version 1.2, which has been criticized as being slow, complexly configured and lacking network management. "On disk operations, it's from four to six times faster for file access across the local-area network," Reiswig said.

The IBM LAN Support Program, which standardizes an IEEE 802.2 Logical Link Control interface across all of IBM's local network offerings, includes a configuration utility to simplify the installation of IBM local net software.

BBN from **page 5**

sembler/disassemblers and packet switches. "BBN could help NSS quickly add packet-switching capabilities to its multiplexer," said Rudolf Strobl, senior consultant at Arthur D. Little, Inc. in Cambridge, Mass. "The founders of NSS came from Tymnet and have a packet-switching background."

The N16 was designed to support both packet switching and circuit switching. The packet-switching capabilities will not be included in the first release of the product, scheduled to ship this June, but are expected to be added in later releases.

The purchase also saves BBN the up-front research and development expenses that would have been required if the company wanted to enter the T-1 multiplexer ring. "Established vendors are looking for partners to enter new markets," Strobl said. "Product development cycles are long and getting longer, and product life cycles are becoming shorter. Vendors are leery of trying to develop products from scratch."

NSS has experienced problems since its founding in 1983. The company planned to ship its first product, the N16, in the spring of 1986. Last summer, a new schedule was set up. Last fall, the N16 was shipped to a beta test site, Citicorp, where the multiplexer reportedly operated as advertised.

By December 1986, NSS had accumulated a debt of $12.5 million and needed a third round of financing, which was completed in January and raised another $4 million. In conjunction with the refinancing, the company laid off almost a third of its work force.

To sell the N16 without BBN's aid, NSS would have had to ramp up its production facilities and set up a direct sales and support staff. Even if those two moves were successful, it might have experienced difficulty turning a profit. By teaming up with BBN, NSS gains a manufacturing arm and an established sales force.

Promise from **page 4**

OS/2 is IBM's first implementation of IBM's Systems Application Architecture (SAA), a broad blueprint laid out by IBM three weeks ago that is intended to define how applications can be developed to run across major IBM processor lines.

The operating system, an initial version of which will be shipped in the first quarter of next year, will include a user interface that will be used by all future IBM applications.

The second release of OS/2 will include device drivers for data-link protocols, such as Synchronous Data Link Control and the Token-Ring interface.

Some analysts welcomed the additional detail on SAA. "This first implementation of SAA is more important than the announcement of SAA itself two weeks ago," Strobl said.

But others were unhappy with the long interval between the announcement of OS/2 and the shipment of the new operating system. "The biggest drawback is that users will have to wait until late 1988 or even 1989 for many of the really advanced capabilities of OS/2. Many large users need those capabilities now," Pickens said.

Some observers applauded IBM's enhanced local network management products, including IBM's new LAN Manager, which can monitor remote Token-Ring Networks. "Large companies did not want to have a separate network management system for each of their Token-Ring locations," Strobl noted.

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Telenet from **page 2**

also be created by interfacing these backbone nets to Telenet's public data network. Telenet can further offer network monitoring, management and maintenance, making it a full-service network provider.

According to Holmblad, Telenet will sell full network services incorporating all these components or any combination of the network systems. Only AT&T has the ability to offer a similar service, he said.

Victoria Marney-Petix, a telecommunications analyst with San Jose, Calif.-based DataQuest, Inc., said users are clamoring for one-stop shopping and could benefit from such a service.

"Users don't want to deal with four or five vendors," Marney-Petix said. "It's not that they don't like having a lot of vendors to choose from. But as networks get more and more complex, they don't want to have to go to more than one vendor to get their services."

The basic building block of IDN is the Telenet TP7/I T-1 switch, a Timeplex Link 2 T-1 multiplexer. Like other T-1 multiplexers, the TP7/I is typically used to break down the 1.54M bit/sec capacity of T-1 links into 24 56K bit/sec DS0 channels. Telenet packet-switching equipment can be interfaced to the TP7/I using an in-house-developed device, enabling DS0 channels to be dedicated to packet-switching use.

Telenet, according to a company spokeswoman, will initially limit IDN transmission facilities to US Sprint's fiber-optic network, but will not exclude use of other carriers.

IDN network management is provided by the TP5/II-5003 Transmission Management System, which is comprised of Telenet-developed network management software running on a Prime Computer, Inc. minicomputer.

The package will monitor network operation, record alarm conditions, maintain a network status data base and also configure network nodes from a central location.

In addition to hardware costs, which Telenet has not yet established, IDN will include recurring monthly transmission charges.

The expansion Telenet has planned for its public packet data network is the first since the company added 45 Uninet, Inc. cities to Telenet, after the two companies merged as part of the formation of US Sprint.

Initially, Telenet will install PADs and packet-switching equipment in 20 cities nationwide. Over the next year, some 100 to 110 other switching centers will be equipped. The actual placement of those switching centers depends in large part on customer demand, Holmblad said.

Telenet officials also said the firm would actively seek collocation of its equipment within Bell operating company central offices. Telenet struck an accord with Mountain Bell last month to collocate its packet switches at Mountain Bell's Phoenix central office ("Telenet, BOC collocate," *NW*, March 2).

Adding switching centers will better prepare Telenet to market against BOC services, Marney-Petix said, because the BOCs will be stressing their closeness to the user.

"The BOCs are using the closeness of switching equipment to the user as a reason why people should buy their services," Marney-Petix added.

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AT&T from **page 1**

which range in size from 40 to 800 lines. According to one consultant, the new System 75 XE may cost one-quarter as much as the current switch in low-end configurations.

The System 75 XE overlaps the territory of AT&T's System 25, a digital PBX that handles 20 to 150 lines, and, according to some corporate users, raises questions about that low-end switch.

The System 75 XE supports distributed PBX networking applications such as AT&T's Audio Information Exchange (Audix) Voice Messaging, Automatic Call Distribution and message center applications, which are advanced features the System 25 lacks.

According to AT&T specifications, the System 75 XE can be configured as a one- to four-cabinet system. A single-cabinet configuration can support as many as 100 lines and as few as 40. A four-cabinet system can handle 600 lines. The low-end System 75 is only available in a single cabinet about the size of the four-cabinet 75 XE.

AT&T said a System 75 XE configured to support 100 lines will cost $670 per line, while current models of the System 75, also configured to support 100 lines, cost roughly $800 per line.

Bill Regli, PBX switching systems business manager for AT&T, said the System 75 XE, equipped with an optional Processor Interface Board, supports all the distributed communications services available with existing models of the System 75.

"The System 75 XE will better price-position the PBX in the under-150-line market with users that require higher functionality than is available with the System 25," Regli predicted.

But two large System 75 users told *Network World* that the introduction of the System 75 XE lessens the appeal of the smaller, less powerful System 25.

Tom Frenette, president of the National System 85 Users Group and a network communications manager with Black & Decker Corp. in Towson, Md., said, "We already have three Systems 75s in and three more on the way. I have a proposal on my desk for a System 25 for use in a small office, and I have some problems with it," he said.

Gevenie Delsol, corporate business communications director for the San Francisco-based Levi Strauss & Co., said the company uses 10 System 75s and a pair of System 25s. "This announcement would put the System 25 in direct conflict with the System 75," she said. "What is going to happen to the System 25?"

Northern Telecom is slated to counter AT&T's move with the announcement this week of the SL-1ST, a scaled-down model of the base SL-1, which sources close to the vendor said will support the same number of lines as AT&T's 75 XE.

Northern Telecom refused comment. But George Hellyer, president of the National SL-1 Users Group and a telecommunications supervisor for Tufts University in Medford, Mass., said he had been briefed on the new switch and believes it would cost $500 to $600 per line. "Northern Telecom will be able to offer the reengineered and smaller SL-1 to users at lower prices than earlier SL-1 models," he explained. Hellyer said use of the new SL-1ST will enable the university to deal with Northern Telecom for all sizes of PBXs.

Gary Rae, vice-president of the National SL-1 Users Group and office and telecommunications services manager with the Twinsburg, Ohio-based Revco D.S., Inc., said the introduction of the SL-1ST is long overdue. "I'm disappointed," he said. "This is a marketplace Northern Telecom has not gone after. I've been forced to buy switches from other vendors because of this problem."

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Trade from **page 1**

end users as part of a 6-month-old effort to lessen its dependence on OEM sales (see "Philips, British Telecom join U.S. modem market," page 2).

European heavyweight Siemens, which is already a participant in the domestic private branch exchange and telephone company central office switch market, announced that it intends to sell its packet-switching equipment directly to Fortune 500 companies (see "Siemens shifts aim to U.S. corporate users," page 4.)

International trade topic

International trade was a cornerstone of Sen. Timothy Wirth's (D-Colo.) keynote address. The global market for telecommunications equipment and services was nearly $400 billion in 1986 and is estimated to climb to $540 billion by 1990, Wirth said.

"The information industry will soon be the largest part of our economy — yet last year, our trade deficit in telecommunications equipment soared to over $1.3 billion," he said.

The senator said the escalating trade deficit is due in part to barriers erected by foreign companies. "Congress can help to encourage competitiveness and growth by taking steps that do not close our own markets, but which instead are aimed at opening foreign markets," he said.

Wirth stressed that one of the key roles of public policy, particularly in the telecommunications arena, is to promote competition. Congress is wrestling with the issue of lifting restrictions imposed on the regional Bell holding companies by U.S. District Court Judge Harold Greene in the Modified Final Judgment.

Given the complexity of the issues that revolve around the Justice Department recommendation calling for wholesale changes in the Modified Final Judgment, Wirth doesn't expect a decision from the court before the fall.

Wirth added, however, that in trying to achieve deregulation, "The FCC and other regulators have botched the job more than once and have unnecessarily disrupted the communications marketplace. We are still in the midst of a delicate transition to a fully competitive marketplace."

For the estimated 15,000 people attending the 15th annual Interface conference, competition abounded at the show, in the form of 360 exhibitors. The first Interface conference, in 1973, hosted 35 vendors, roughly 20 of which are now defunct.

Show attendees were shopping for everything from T-1 multiplexers to local network products. M. Kay Randall, director of the Computer Services Department for the County of Fresno, Calif., came looking for T-1 equipment. Fresno is looking to upgrade its data network from leased lines with 4.8K bit/sec modems to T-1 lines, Randall said, and the large number of T-1 exhibitors made it easy to get a quick overview of the market.

Several attendees said network management continues to be a thorn in their sides. Two managers from the Postal Data Center in St. Louis, Mo., who came to look for a network management system that could control multiple network components from a single workstation, said they were frustrated in their quest.

Still other attendees said they were exploring the technology and potential of using local networked personal computers to replace larger processors in their information systems networks (see "Users split on swapping PCs for minis," page 2).

80386 network roles

Several sessions on T-1, IBM's Systems Network Architecture and Integrated Services Digital Networks drew heavy crowds, as did a session on network roles for the Intel Corp. 80386 microprocessor. Because the 80386 can provide minicomputer-type capabilities, it will prove attractive as a base for file, communications and network management servers, according to Dale Kutnick, executive vice-president of research for Gartner Group, Inc. in Stamford, Conn.

"There's going to be quite a battle between the Novells, 3Coms and Ungermann-Basses and the IBMs and DECs" to provide network servers, Kutnick told session attendees.

In the short term, Kutnick recommends that users buy local networking products from companies such as Novell and 3Com. "These vendors' products currently offer better price performance and are relatively easy to use," he said.

In the long term, however, Kutnick believes vendors who offer departmental systems, such as IBM, DEC and Wang Laboratories, Inc., will have more attractive local networking solutions. In particular, Kutnick expects these vendors will offer more sophisticated network management.

Connectivity was also a key show topic. C.M. Killion, engineering manager for Network Engineering and Planning at Pacific Bell, said he was looking for products that would allow Apple Computer, Inc.'s Macintosh personal computers to communicate on a peer-to-peer basis with IBM Personal Computers over a facilitywide network.

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CALENDAR

April 8-10, Dallas — IBM Products & Architectures. Also, April 22-24, Arlington, Va. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92750.

April 9-10, St. Louis — Understanding Integrated Services Digital Networks. Also, April 21-22, Boston; April 27-28, Atlanta. Contact: Telecommunications Research Associates, P.O. Box 1200, Newark, Ill. 60541.

April 9-10, Washington, D.C. — T-Carrier Networking Decisions. Contact: The George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

April 9-10, New York — Satellite Status '87. Contact: Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

April 13-15, Vancouver — Info Canada '87. Contact: Vancouver Chapter of Data Processing Managers Association, c/o Venue West, 801-750 Jervis St., Vancouver, B.C.

April 13-15, Colorado Springs — An Introduction to Data Communications. Also, April 22-24, Chicago; May 4-6, St. Paul, Minn.; May 11-13, Boston. Contact: The American Institute, 55 Main St., Madison, N.J. 07940.

April 13-16, Salem, N.H. — Designing and Installing Fiber Optic Networks. Contact: Clifford, Inc., P.O. Box 51, Bethel, Vt. 05032.

April 14-16, Dallas — Consulting Skills for the IC Professional. Also, May 18-20, Chicago. Contact: Arnoudse & Ouellette, No. 66, 40 South River Road, Bedford, N.H. 03102.

April 14-16, Chicago — Telecommunications Transmission Systems. Contact: abc Teletraining, Inc., P.O. Box 537, Geneva, Ill. 60134.

April 15, Long Beach, Calif. — The T-1 Network Exchange. Also, April 16, Burlingame, Calif.; June 4, Denver. Contact: Avanti Communications Corp., Aquidneck Industrial Park, Newport, R.I. 02840.

April 15-16, Washington, D.C. — RBOC Diversification Strategies, 1987 and Beyond. Contact: TeleStrategies, Inc., 1355 Beverly Road,McLean, Va. 22101.

April 20-22, Avon, Colo. — Data Dictionaries, Data Element Naming and Data Standardization. Contact: Barnett Data Systems, 19 Orchard Way North, Rockville, Md. 20854.

April 23, Boston — Fiber-Optic Venture '87. Contact: Kessler Marketing Intelligence, America's Cup Avenue at 31 Bridge St., Newport, R.I. 02840.

NetView from **page 1**

NetView within the next few weeks. Aetna Corp. plans to evaluate the product next month.

The first release, which began shipping in December, integrates five previously autonomous IBM software packages used to manage data networks: Network Communications Control Facility, Network Logical Data Manager, Network Problem Determination Application, VTAM Node Control Application and Network Management Productivity Facility.

Because Sears is one of IBM's largest customers — Sears' nationwide network includes more than 6,000 IBM hosts, controllers and front-end processors to support some 60,000 users — the company was one of the first to purchase NetView. Running on a dedicated IBM 3090-200 mainframe at the company's network control center in Arlington Heights, Va., NetView manages and controls the entire Sears network.

"Obviously, NetView is IBM's strategic network management product and provides the base for the company's future network management and control packages," said Gary Weiss, vice-president of data communications at Sears Communications Corp.

Although some analysts criticized the first release of NetView as a simple repackaging of existing products, David Fenstemaker, assistant vice-president at First Interstate, disagreed. "NetView is much easier to use than any of the separate packages and cuts down on the time needed to train a network operator." He said NetView offers consistent commands and programmed function keys that make it easier to use than the stand-alone tools.

First Interstate's network links the firm's branch offices, automated teller machines and 10 regional data centers in the western U.S. NetView is running on IBM mainframes at four network control facilities, one of which serves as a central control point, and is being used to manage the entire network.

Sears' Weiss said NetView includes some functions not found in the five stand-alone packages. He said that NetView, coupled with the IBM 5860 diagnostic modems that were announced with NetView last May, improve Sears' ability to diagnose analog line problems. "NetView enables us to remotely view individual line parameters, so we are better able to tell the telephone company what is wrong with a line," he said.

The three early users reported few problems installing NetView. "NetView went in more easily than any of the separate products," Weiss said. The users reported that the installations took two to six weeks. Since the product requires the latest release of VTAM, Release 3.1.1, some users had to upgrade to that release of VTAM before installing NetView.

Fenstemaker said that Command Lists (CLIST), single commands that perform multiple functions written for the five autonomous packages, can be used with NetView. He added that new NetView CLISTs automate net management tasks, such as reestablishing terminal sessions, that had to be performed manually with the autonomous packages.

Customers agreed that one drawback is NetView's operating overhead. "The product eats up a lot of processing cycles," said David Heberer, division manager for the data center at Southwestern Bell. Heberer declined to discuss Southwestern Bell's use of NetView or the network it is being used to manage.

Users agreed that storing network management information collected by NetView can be a problem. "We would like to take a close look at our session awareness data, such as response time and which terminals are connected to which applications," Fenstemaker said. "In large networks, such data can quickly use up large amounts of virtual storage and strain a host's performance."

Customers said they would like to see NetView's scope widened to include other IBM network management packages, such as Network Performance Monitor (NPM) and Operator Communications Control Facility (OCCF). One manager, who asked not to be named, said IBM explained that the group responsible for NPM is now reporting to the group managing NetView, and the product may be included in the next release of NetView. IBM also told the user its long-term strategy included bringing OCCF under NetView's aegis.

The early users also said they anticipate that NetView/PC will help them further extend the reach of their network management systems. Production shipments should begin in June for NetView/PC, which is software that runs on an IBM Personal Computer and acts as a gateway between NetView and other vendors' network management systems.

But they are not sure how much work would be required to integrate NetView with NetView/PC. "I don't expect the first release of NetView to fully support NetView/PC," the manager said. "I think that NetView/PC will require installing a new release of the product or a programming fix."

Some users are already looking beyond the initial release of NetView/PC, which enables information on network problems to be sent from NetView/PC to NetView. Users want to be able to control other vendors' equipment devices from a NetView terminal.

Philips from **page 2**

agnostics and control, reporting functions and network administration capabilities. Fully configured, it will support up to three operator consoles, two system printers, 150 diagnostic ports and up to 2,000 devices. Pricing for an entry-level configuration is $21,250, including a controller, console and printer.

Dallas-based Philips Information Systems will market four Sematrans modems, which are manufactured by Philips' subsidiary, Telecommunications Radioelectriques et Telephoniques (TRT). Philips Information Systems is a U.S. affiliate of Philips Industries N.V., a $60 billion multinational electronics firm based in Holland.

"More and more, this country is following international standards, so this market is really opening up," said Marc Houery, marketing director for Paris-based TRT.

Philips' Sematrans 9696 V.32, priced at $2,995, operates in full duplex at 9.6K and 4.8K bit/sec over standard two-wire dial-up lines. It handles both asynchronous and synchronous data and uses an echo-canceling technique that allows the modem to be used on satellite circuits as well as land links, a company spokesman said. The Sematrans 9631 V.29 modem handles synchronous data transmission at 9.6K, 7.2K and 4.8K bit/sec. It is priced at $1,495, and it is also available with network management and multiplexer options.

The 4821 V.27bis and ter modem can handle synchronous and asynchronous data at 4.8K and 2,400 bit/sec over the public switched telephone network, or multipoint operation over four-wire unconditioned leased lines. It costs $1,095.

The Philips 1042 short-haul modem, priced at $565, uses echo canceling to support asynchronous and synchronous data at rates from 1,800 to 19.2K bit/sec. The modem provides full-duplex operation over two wires. All four modems allow for either full- or half-duplex operation.

Philips also introduced a pair of packet-switching products, including the FlexPac NPX 090, which is an X.25 network processor that can serve as a private network node and access point capable of handling up to 800 packets per second. Pricing starts at $17,950 for an eight-line configuration. The FlexPac NPX 09 X.25 switching packet assembler/disassembler is a network node with general purpose ports that support X.25 synchronous or asynchronous users. The NPX 09 handles 150 packets per second. Pricing for an eight-line configuration is $4,965.

Mitel Datacom, Inc. will market British Telecom modems compliant with the CCITT V.32, V.29 and V.33 standards. Mitel Datacom, of Herndon, Va., is a wholly owned subsidiary of Mitel Corp. of Kanata, Ont., which in turn is 51% owned by British Telecom. British Telecom is an operating company of the new products division of British Telecommunications plc.

The V.33 modem, the DM 4141X, operates at 14.4K, 12K and 9.6K bit/sec and provides full-duplex synchronous data transmission over four-wire private circuits. This modem uses trellis-coded modulation and is priced at $3,495. The V.32-compliant DM 4962X operates at 9.6K and 4.8K bit/sec and is a full-duplex modem capable of handling synchronous or asynchronous data over two-wire unconditioned private circuits. It is also priced at $3,495.

The DM 4960FTX, a V.29 modem, offers synchronous data transmission at 9.6K, 7.2K, 4.8K and 2,400 bit/sec. It can be used with four-wire private circuits or two-wire public switched telephone networks and costs $1,950.

Fujitsu America's Data Communications Group EZ Series modems are designed as low-cost versions of Fujitsu's L Series modems. They are priced from $695 for the 2,400 bit/sec modem to $2,995 for the 14.4K bit/sec model.

All five models are full duplex and support synchronous data over four-wire unconditioned telephone lines. Each model supports CCITT standards: The EZ 2400 is V.26-conformant; the EZ4800 conforms to V.27 standards; and the EZ9600 and EZ 9600FP are V.29-conformant. The EZ 14.4K uses trellis coding and conforms to CCITT V.29 at 9.6K bit/sec.

Users from **page 5**

providers, but they will eventually offer ONA features to users as well.

"Southwestern Bell has taken the position that we'll discuss our ONA plans with anybody who's interested, but our initial marketing thrust will be with the enhanced service providers," said Richard Vehige, assistant vice-president at Southwestern Bell. "We've solicited input from a wide variety of sources, but in all honesty, there haven't been many users knocking at our door."

US West began providing some end users with ONA-type services before the ONA concept was developed, said John Davis, director of external liaison at US West. "If a user comes to us and asks for service, we'll try to meet his needs."

Despite this limited user involvement, the RBHCs said they need to make more of a concerted effort to find out the type of network features needed by the user community and develop a means of delivering these options over the existing public networks.

For instance, a large end user in the manufacturing industry needs different types of switching, access and transmission than an enhanced service provider of voice messaging.

"The RBHCs should set up a small task force to address the needs of large end users," Phillips said. "The RBHCs would find that, not only are users eager to participate, but they would bring valuable information to the ONA dialogue."

When asked why the RBHCs seemed to be leaving the user community out in the cold, Phillips said, "This is a lingering effect of the old Bell culture, in which you don't consult with users. You just develop your menu of services, put it on the table and tell the user to take it or leave it."

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